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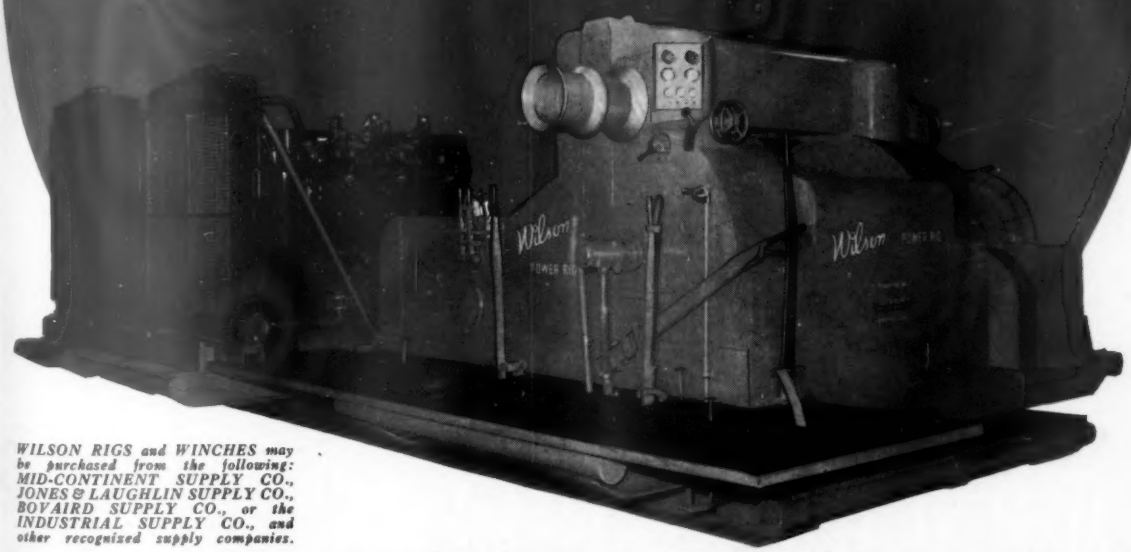

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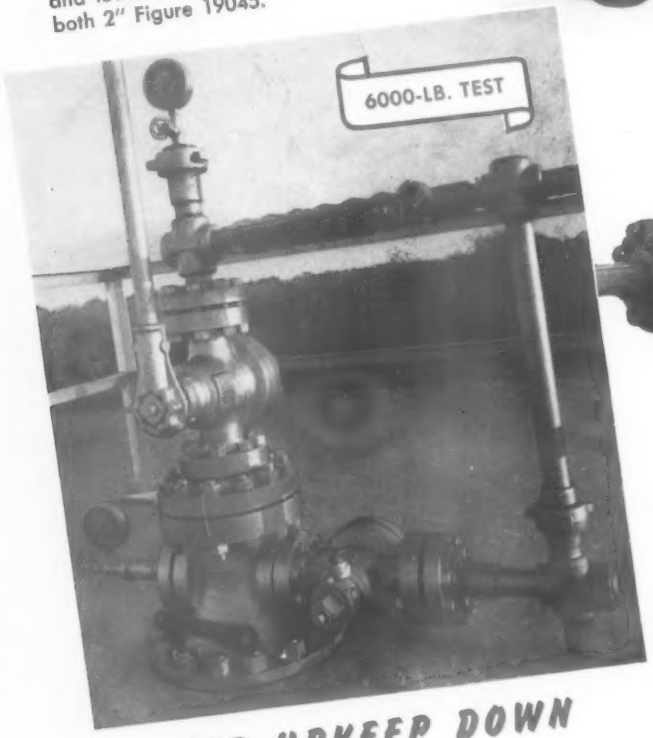

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published weekly by the

PETROLEUM PUBLISHING COMPANY

211 S. CHEYENNE AVE., TULSA 1, OKLAHOMA

Subscription rate to the petroleum industry, United States and foreign, 1 year, $6.00; 2 years, $10.00; 3 years, $12.00; 5 years, $15.00. Single copies, 20 cents. Back copies, when over a year old, 50 cents. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1945, by The Petroleum Publishing Co.

Vol. 43, No. 38 January 27, 1945

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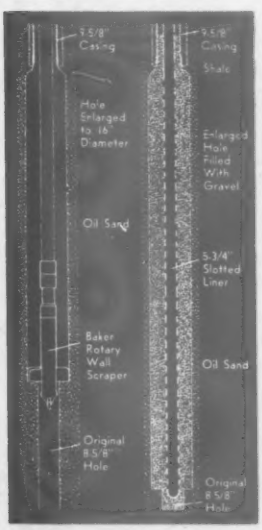
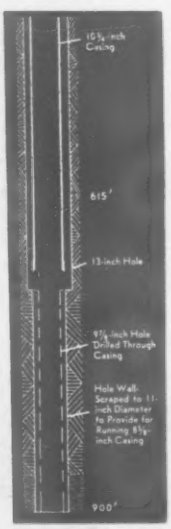


Enlarging hole for gravel packing around liner.

Scraping face of oil sand and enlarging bore for maximum recovery.


10 3/4 inch Casing
615'
13-inch Hole
9 5/8 inch Hole Drilled Through Casing
Hole Wall Scraped to 11-inch Diameter to Provide for Running 8 5/8-inch Casing
900'

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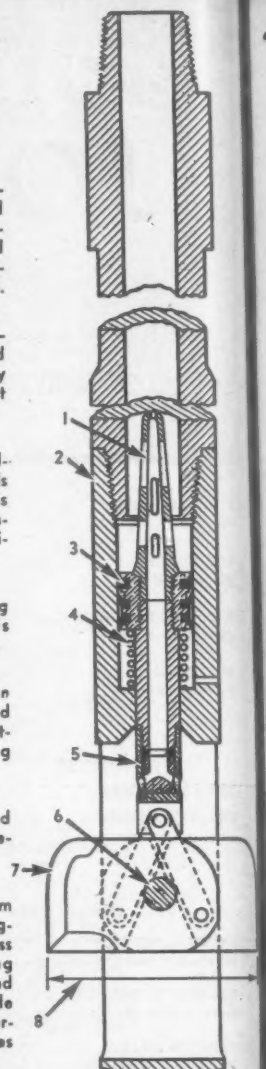

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Trends

Crude-Oil Production
By States—Page 284

CRUDE-OIL STOCKS 221,114,000 bbl. as of January 13—up 783,000 bbl. One year ago 238,148,000 bbl.

GASOLINE STOCKS 87,814,000 bbl. as of January 13—up 1,198,000 bbl. One year ago 78,043,000 bbl.

RESIDUAL FUEL-OIL STOCKS 54,207,000 bbl. as of January 13—down 1,867,000 bbl. One year ago 53,579,000 bbl.

GAS OIL AND DISTILLATE STOCKS 36,410,000 bbl. as of January 13—down 1,888,000 bbl. One year ago 39,603,000 bbl.

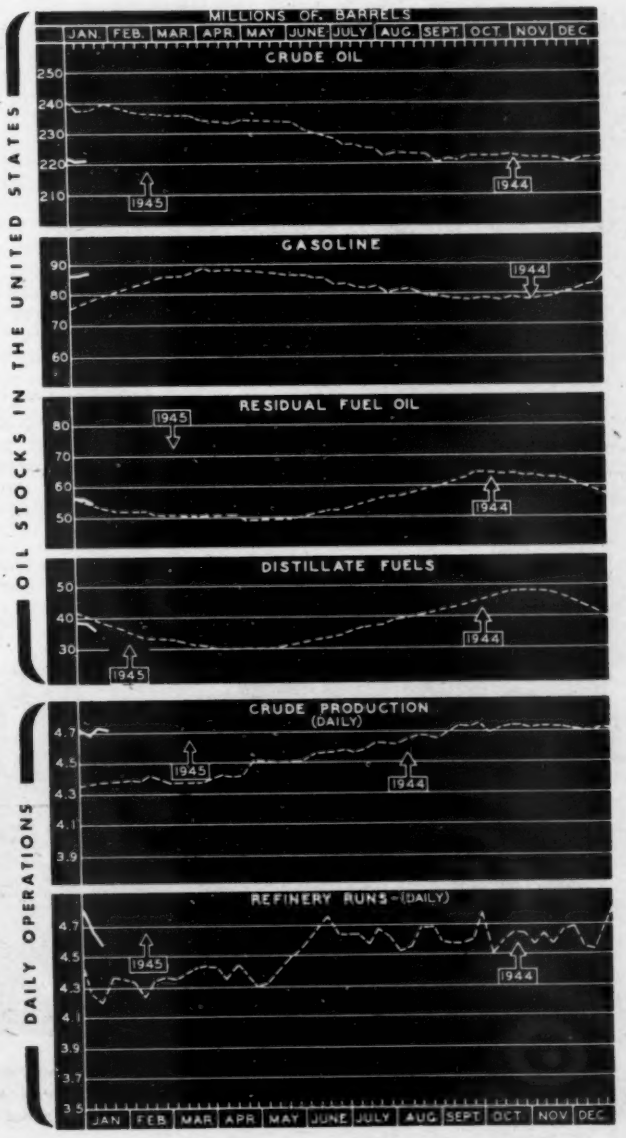
CRUDE OIL PRODUCTION 4,710,550 bbl. as of January 20—down 8,050 bbl. One year ago 4,391,355 bbl.

REFINERY RUNS 4,570,000 bbl. daily week ended January 13—down 86,000 bbl. One year ago 4,202,000 bbl.

LATER developments probably will add importance to the announcement that Office of Price Administration in its forthcoming investigation of crude-oil costs will include an analysis of the current expenditures required to find reserves in new fields. This action was taken at the conclusion of the several-day meeting of OPA representatives with 23 operators recently appointed as an advisory group in oil-production price matters by the government agency. It was made clear by the pricing agency that the usual governmental procedure of determining costs on a basis of previous operations would be followed in deciding whether present ceilings should be raised, but the agency is willing to be the collecting medium in determining replacement costs. These costs, the advisory group insisted, should be controlling in arriving at crude price schedules throughout the remainder of the emergency. Additional details of the program are explained elsewhere in this issue.

WHILE doubt is expressed that the replacement cost information, which is to be collected quickly, will result in favorable price action in the near future, students of the industry feel that the program is an essential step in the right direction looking to the end of the European war and later to the ending of all hostilities. Those who have made a partial study of the subject say present-day exploration costs are more than 50 cents per barrel above posted schedules in the southwestern states. At the same time it is conceded that due to the record production of 1,680,000,000 bbl., costs in most areas in 1944 generally were little or no higher than was revealed in other recent investigations.

THE MAIN point stressed by economists and other students of price trends is that the industry needs data which accurately reflect operating costs under all conditions. It is pointed out that after the European war ends there will be adjustments which will change existing cost figures, with a general readjustment necessary when demands for a time are curtailed by the arrival of final peace. While operators are hopeful for a return of competitive pricing in the postwar period, it is felt that cost information should be available for the industry itself and any Washington investigations of the future.



Cost of Replacing Reserves Included in OPA Study

by Henry D. Ralph

WASHINGTON.—Substantial agreement on the method of making a survey of the cost of producing crude petroleum was reached at a 3-day meeting of the industry-advisory committee of the Office of Price Administration last week.

A questionnaire form will be sent to approximately 600 typical producers asking data on both historical and prospective costs of discovering and producing crude. This is a combination of the method used by OPA and that desired by the committee.

The committee insisted that current replacement costs should be the basis of price ceilings on natural-resource industries as a matter of conservation and public policy. OPA officials countered that while this might be sound there is no legal authority for such action at present and OPA is bound to base ceilings on the current earnings position of the industry based on costs of acquiring and producing material now held.

As a result, the questionnaire will ask figures on both bases, using figures of the Petroleum Administration for War for crude discovered during 1944. In the opinion of OPA this will be a conservative estimate, and therefore will show a high cost per barrel discovered, because reserve figures are customarily revised upward in later years and attributed back to discovery year.

OPA will compile the replacement cost data and turn them over to the industry for such action as it may take but will refuse to base ceilings on them without instructions from Congress, the Office of Economic Stabilization, or some other superior authority. This apparently satisfied the committee, and the new figures may become the basis for a price-increase campaign outside of the OPA's legal appeals procedure.

Meanwhile, details of the questionnaire form are being completed by OPA economists, following suggestions made by the committee. No arbitrary flat figure for discovery costs will be used, but it was felt that sufficient information could be obtained from the books of most producers to give a reasonably accurate picture of the cost of discovering crude now being sold, as well as current operating costs. As soon as the form is completed it will be submitted to a subcommittee appointed for the purpose, after which it must be approved by the Bureau of the Budget before being sent out.

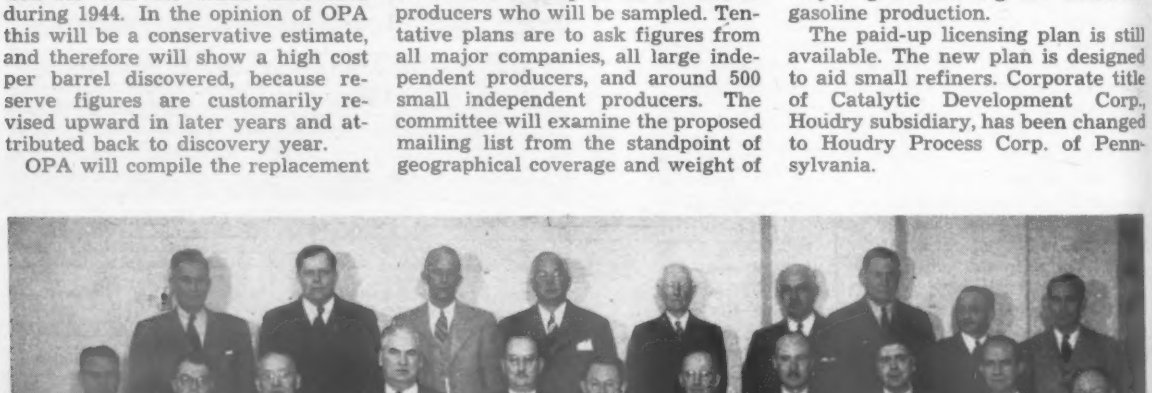
In addition to the form, the subcommittee must pass on the list of producers who will be sampled. Tentative plans are to ask figures from all major companies, all large independent producers, and around 500 small independent producers. The committee will examine the proposed mailing list from the standpoint of geographical coverage and weight of production. This may be done by correspondence through the chairman, E. P. Potter of Amerada Petroleum Corp., or the subcommittee may meet in Chicago or St. Louis for the purpose. The full committee of 23 members is not expected to reconvene until survey is finished.

The Independent Petroleum Association of America has withheld filing its proposed formal protest against the present crude-price ceilings because both OPA officials and the advisory committee declared this would interfere with the present cost survey. However, more than 1,000 producers have executed powers of attorney for such a protest and it may be filed later if satisfactory action is not obtained from OPA.

Houdry Adopts New Licensing Plan

NEW YORK.—Arthur Danner, executive vice president, Houdry Process Corp., this week announced adoption of running royalty arrangement for licenses of Houdry catalytic cracking processes. Danner pointed out that the plan is applicable to licenses both for Houdry fixed bed and Thermofor catalytic cracking processes and covers catalytic-cracking operations generally regardless of end products. The terms are 5 cents per barrel for fresh feed charge with no additional cost for recycling or treating for aviation-gasoline production.

The paid-up licensing plan is still available. The new plan is designed to aid small refiners. Corporate title of Catalytic Development Corp., Houdry subsidiary, has been changed to Houdry Process Corp. of Pennsylvania.



The industry price advisory committee which persuaded Office of Price Administration to include a replacement factor in its study on the cost of producing crude oil. The cost-of-replacement analysis will be ascertained along with other production cost data through questionnaires going to about 600 representative producers

Manpower and Material Outlook Blights Production Prospects

WASHINGTON.—Shortages of manpower and materials were the chief topics discussed at last week's meeting of the Petroleum Industry War Council.

To comply with the government's request to curtail travel the council decided to meet bimonthly hereafter unless it becomes necessary to call special meetings. The next meeting is scheduled for March 14.

The report of the committee on production gave a gloomy forecast of the materials in prospect for all branches of the industry but particularly for producers during the next few months. Due to the increase in military production schedules it appears that sufficient steel will not be available to drill all projected wells unless the War Production Board revises its programs to increase the output of tubular goods and other oil-field equipment.

The production committee pointed out that increased imports of crude oil will be required to meet demand during 1945. A hypothetical curve on the maximum efficient productive capacity of existing fields, assuming an abrupt cessation of all drilling on January 1, was projected by the committee to show the absolute essentiality of sustaining the development program at a minimum level of 27,000 wells. The committee's study disclosed that maximum efficient productive capacity would decline 300,000 daily during 1945 if all drilling were suspended. Failure to accomplish any portion of the projected drilling program will result in a corresponding reduction in the anticipated productive capacity, the committee warned.

Disparity Will Increase

With the anticipated increasing requirements for crude, the disparity between requirements and domestic production will increase in 1945, the committee continued. Should tentative increases in military demands for petroleum products become firm, United States refinery requirements for crude will increase over the programed figures by at least 100,000 bbl. daily, of which 40,000 bbl. daily would materialize in the last half of 1945.

It is anticipated that production will continue at a rate slightly in excess of maximum efficient productive capacity throughout 1945. It is believed by the committee, however, that programed production is sufficiently close to the maximum efficient rates that requirements can be attained without appreciably endangering the ability of the nation's fields to sustain efficient productive capacities. On the other hand, it is stressed that productive capacity can be maintained at the required levels only if materials and manpower are available to complete the 27,000 new wells programed for 1945.

The first 6 months' drilling program calls for 12,900 new wells and the utilization of 537,000 tons of tubular goods. Mill capacity to produce tubular goods for the petroleum industry will total 378,000 tons in the first half with the difference diverted to the increased output of bombs and rockets. The industry, working through the Petroleum Administration for War, the War Production Board and the Army-Navy Petroleum Board is seeking to adjust the difference between probable supplies of tubular goods and the requirements dictated by the drilling program which is conceded to be essential to support the desired volume of crude production.

Transportation Deficiencies Threaten Critical Shortage in Eastern Supplies

WASHINGTON. — Transportation and distribution difficulties may lead to a serious shortage of civilian heating oil supplies in the eastern United States before the winter is over, the Petroleum Industry War Council was informed this week by its committee on economics. The committee expressed the hope, however, that an additional assignment of oil tankers to East Coast service might stave off a crisis

Simultaneously PIWC was told that:

"The current trend of gasoline inventories, coupled with the transportation situation and recent events on the battlefields of Europe, confirms the opinion that no additional civilian gasoline can become available as long as the war in Europe continues. The changed situation abroad bears witness to the uncertainties involved in attempting to evaluate that equation. In fact, the vast importance of quick over-land movement by motor truck of men, ammunition and other materials as life-saving factors has again been driven home."

Industry executives likewise received the report from the committee that because of the industry's war effort December saw a new high record in the production of aviation gasoline in spite of quality improvement which tended to reduce volume. Also previous levels were exceeded in the output of toluene for explosives, butadiene for the manufacture of synthetic rubber and other military products.

Dislocations in the movement of oil to the East Coast were ascribed, in part, to adverse weather, as well as military contingencies.

"Tightness in the transportation situation may cause serious shortages in the East before the winter is over," Dr. Robert E. Wilson, chairman of the economics committee, reported.

"While industry and war emergency pipe lines have continued to perform in excess of estimates, moving an average of about 735,000 bbl. a day to the East, tank-car movements are running about 50,000 bbl. daily below levels anticipated partly due to adverse weather. Barge movements are being curtailed by freezing of the upper Ohio River.

"Tanker movements are at a level slightly above last fall, but they were below schedule and not enough additional can be made available to offset the shortage from other methods of transportation.

Rates Below Necessity

"The over-all level of receipts in the East during the last available 4-weeks period appears to be running between 125,000 and 150,000 bbl. a day below the rate necessary to supply anticipated demands of the first quarter of 1945 while retaining reasonable working levels.

"Heating-oil stocks are below those of last year and production is running behind required levels. Current stocks of other products in the East, thanks to the reasonably high level to which they were built up in the early fall, are slightly higher than a year ago."

Urging necessity of conservation on the part of all heating-oil users, Chairman Wilson said record-low inventories and attendant difficulties of distribution may be experienced before the end of this winter. He recalled low inventories led to severe local shortages in the winter of 1942-1943 and he warned that while winter temperatures up to the

end of 1944 averaged about normal, January of this year has been running substantially below normal.

The PIWC advisers explained that there are about 5,500 tank cars more than anticipated in Southwest to East Coast service but from the Midwest to the East Coast, a shorter haul, the actual number of cars in use is about 4,000 less than expected. A switch of 4,000 cars from the Southwest to East movement to the Midwest to East movement, they said, would increase deliveries to the East Coast by about 12,000 bbl. a day, but added that this cannot all be accomplished because of the necessity of providing refinery outlet in the Southwest.

The report related that:

"Increased military demands have more than used up the increased amount transported by tankers, so that movements north of Cape Hatteras available for civilian use in December were about 50,000 bbl. daily short of requirements even if tank cars had moved 550,000 bbl. a day instead of the 519,000 rate actually recorded. Assignment of additional tankers to East Coast service is necessary if reasonable relationship between supply and demand is to prevail during the remainder of the winter. Inventories of major products within the eastern area cannot continue to withstand the rate of withdrawal.

PIWC Asks Delay in Natural-Gas Probe

WASHINGTON.—A resolution urging that the Federal Power Commission abandon its scheduled investigation of the natural-gas industry at least until after the war was adopted by the Petroleum Industry War Council at its January meeting.

Pointing out that oil and natural gas are frequently produced jointly and used competitively, the council declared that the investigation would require the time of many oil company executives and technical men currently devoting all their efforts to the war program. It asked that the commission confine its present activities to activities required by the war, and declared that if, after the war, a general study of the natural gas industry is felt necessary it should be conducted by a committee of Congress with the assistance of various government agencies.

Draft Formula Sought to Defer Key Oil Personnel

WASHINGTON. — Labor advisors of the Petroleum Administration for War are working with officials of the War Manpower Commission and Selective Service in an attempt to evolve a draft-deferment policy which will permit the oil industry to retain sufficient technical and key men to meet prospective demands for petroleum products in spite of the increased induction rate of the armed forces.

So far no special occupational deferment method has been found but there have been no changes in the regular system under which employers may appeal to state draft directors. The new list of critical occupations on which deferment may be based includes virtually all important positions in the oil industry which formerly were rated essential except that all exploration activities remain in the lower classification of essentiality. However, all technical, scientific and management services in exploration as well as other branches are to be considered critical.

The present outlook is that all branches of the industry will have to do without a great many men now considered essential.

New Richmond Unit Makes Refinery One of Largest 100-Octane Sources

SAN FRANCISCO.—The new $20,000,000 Defense Plant Corp. 100-octane gasoline plant operated by Standard Oil Co. of California was dedicated at Richmond, Calif., last week. This new installation makes the Richmond refinery one of the world's largest producers of gasoline rating 100 octane or better.

The thermofor process derives its name from the kiln used to "rejuvenate" or decarbonize the bead-shaped catalyst. The latter looks like a small pearl and is used by the carload. More than 50 freight cars of catalyst are required to fill the plant.

The products to be cracked are vaporized and then fed to a reactor which in this case is a 50-ft. tower 18 ft. in diameter. It is filled with catalyst which flows downward. The vapor flows upward and in passing through the catalyst deposits carbon on the beads. At the bottom, live steam is shot across under such pressure that it makes almost a solid sheet to retain the vaporized petroleum in the reactor while the catalyst beads, now carbon impregnated, flow out, as rice would run out of a hole in the bottom of a bin.

Beads are caught in an elevator, of the endless-chain bucket type, and hoisted to the top of the thermofor kiln into which they are dumped. Air is blasted into the kiln to burn the carbon deposited on the beads, thus restoring the activity of the catalyst. The purged catalyst is recaptured at the bottom and then conveyed again 200 ft. to the top of the reaction vessel for reuse.

Each of the four catalyst elevators has a capacity of 150 tons an hour and operates in temperatures up to 900° F.

The two kilns in the cat crackers each can burn more than 4 tons of carbon off the catalyst each hour—an amount which further indicates the tremendous quantities of materials handled. Heat generated by the burning carbon is used to generate high-pressure steam to supply, in part, requirements of the other units of the plant.

There are three other major processes in the plant:

1. The butane isomerization unit converts normal butane into isobutane, a required component for production of alkylate. This unit employs the design developed by Standard of California.

2. The hydrofluoric acid alkylation unit which takes isobutane and other light hydrocarbon fractions and synthesizes them into alkylate.

3. Distillation equipment for rejection of normal pentane, which permits removal of low octane normal pentane from base stocks to upgrade them for subsequent use in 100-octane blending.

Standard of California is operating the 100-octane plant under lease agreement with Defense Plant Corp. Construction was sponsored by the Petroleum Administration for War with DPC funds. Equipment process designing with the exception of the catalytic cracker was by the California Research Corp., a subsidiary of Standard. The catalytic cracker was designed by the Bechtel-McCone Corp., which engineered and constructed the plant.

Index Ready Soon

The complete editorial index of The Oil and Gas Journal for 1944 will be ready soon, but, conforming to practice in previous war years, it will not be published in a regular issue. The 1944 index, bound separately, will be sent without charge to all subscribers requesting a copy. Address requests to Circulation Department, P. O. Box 1260, Tulsa.

THIS WEEK

PRICES— Industry committee wins consideration for cost of replacing oil reserves. . . . No assurance that factor will influence decision on crude-oil ceilings but the first hurdle is cleared. . . . Final ruling rests with Economic Stabilizer Vinson and War Mobilizer Byrnes. . . . Agreement reached with OPA on form of production-cost questionnaire. . . . Representative figures will be sought from about 600 operating companies and individuals. . . . Committee members encouraged by acquiescence of OPA on cost-of-replacement argument. . . .

TRANSPORTATION— Larger assignment of tankers to coastwise route necessary to avert late-winter shortage in eastern areas. . . . ¶Diversion of tank cars to shorter haul from Middle West to East Coast may be necessary. . . . ¶ODT calls for daily wire report on tank-car operations—seeking maximum utilization of available equipment. . . . ¶Big-inch lines handling record volumes but are unable to offset lag in tanker and tank-car scheduled deliveries. . . . ¶British disclose details of 1,000-mile system which handles more than 100,000 bbl. daily of military products. . . . Extensive underground storage system nucleus of operation. . . .

INTERNATIONAL—Agreement reached on disputed points in Anglo-American oil pact. . . . Instrument now receiving cabinet-level consideration, probably will be scrutinized by Senate foreign relations committee. . . . Then negotiations with British will be reopened. . . . Industry insists that agreement receive formal sanction as treaty, probably for antitrust protection. . . .

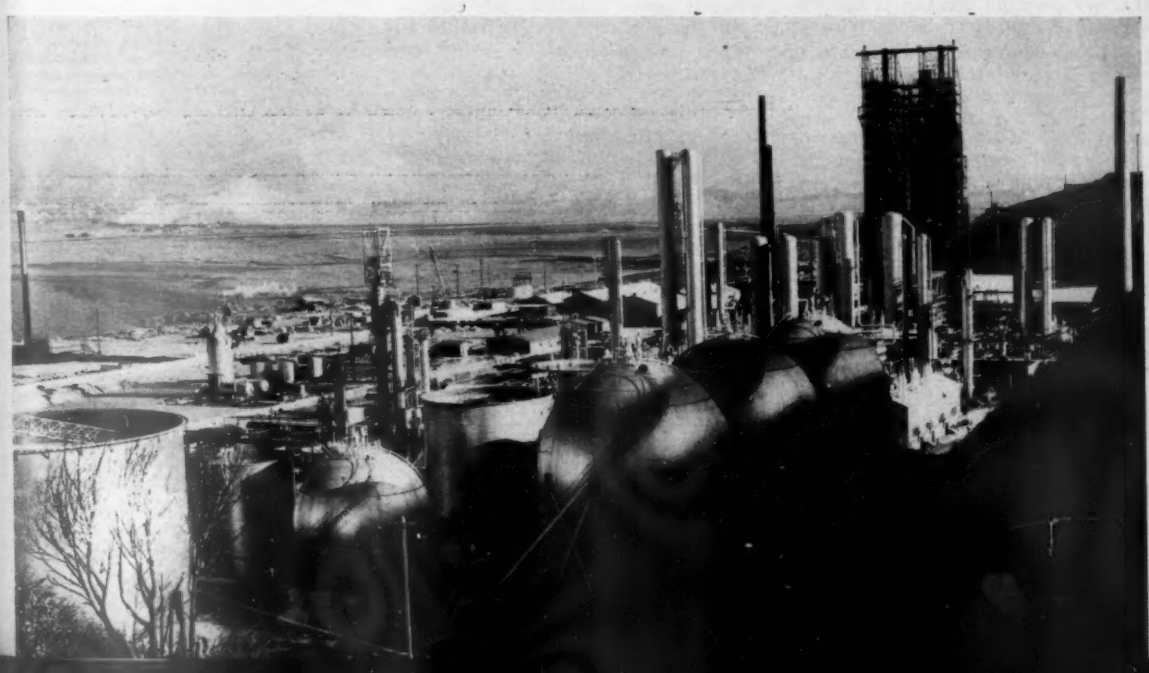
PRODUCTION— Record production quota of 5,074,850 bbl. daily assigned industry for February. . . . Requested output exceeds previous high of last September by 23,550 bbl. per day. . . . Nearly 2,000 bbl. per day of 34,050 increase over December expected to come from natural-gasoline and condensate operations. . . . ¶Texas' increase of 16,000 bbl. per day concentrated in East Texas. . . . Operators protest, fearing additional producing day in East Texas will accelerate pressure decline. . . . Other fields accessible to War Emergency Pipelines asked to increase output with various cutbacks in sour-crude pools of West Texas. . . .

REFINING—Two new 100-octane plants on Pacific Coast go on stream. . . . Industry produced record volume of aviation fuel in December—despite upgrading quality. . . . ¶Revision in demurrage order restores flexibility to refinery shipments. . . . ¶Military call on East Coast plants necessitates delivery of most desirable crude. . . .

DRILLING— Manpower and materials resume position as most troublesome problem confronting operators. . . . Action started to assure deferment of key men remaining in oil operations. . . . ¶PIWC production committee spells out risk of shorting drilling program in terms of barrels decline. . . . Army-Navy Petroleum Board apprized of threatened shortage. . . . Industry feels that, surely by now, no military brass hat fails to understand essentiality of sustaining peak production which can be done only by increased drilling. . . .

NATURAL GAS— Industry council asks deferment of Federal Power Commission investigation. . . . Urges broader investigation by congressional committee when war is over. . . . Probe now, PIWC asserts, would interfere with oil industry's war obligations. . . .

As near Japan's backyard as a domestic aviation-gasoline plant could be built is this new Standard Oil Co. of California unit at Richmond, in San Francisco Bay. Dedication ceremonies last week heralded start of operations and the unit will contribute to another production record for 100-octane gasoline in February



Agreement Reached on Revised
International Oil Pact
Final details now being perfected by cabi-
net-level committee for further discussion

WASHINGTON.—A new draft of the Anglo-American oil treaty was virtually accepted at a series of meetings last week between government officials and members of the national oil policy committee of the Petroleum Industry War Council.

Final details of the revised document are now being perfected by the cabinet level committee which negotiated the original pact and this will be discussed again with PIWC members and with members of the Senate committee on foreign relations before the British Government is asked to reopen negotiations.

Both the officials and the industry men acted informally, since the cabinet committee concluded its official duties when the original treaty was signed and the Council committee discharged its obligation last December when it proposed a new draft. Nevertheless, the two groups conferred on four successive days and reached a virtually complete meeting of minds on all controversial features. Government officials taking part were Secretary Harold L. Ickes, Ralph K. Davies, deputy petroleum administrator; Charles B. Rayner, petroleum adviser of the State Department, and Robert E. Hardwicke, chief counsel of the Petroleum Administration for War.

The chief purpose of the meetings was to find out the reasons for the many changes in wording proposed by the PIWC committee. Industry members conceded that most of them were "stylistic" and not too important and they would not insist on a radical departure from the language of diplomacy used in the formal document which had been signed by the representatives of both governments.

Industry men also expressed the view that the agreement should take the form of a formal treaty ratified by the Senate, rather than an executive agreement. In this way full hearings would be held in the Senate and a complete understanding reached of the intent of the various provisions.

Four troublesome points in the treaty were reduced to a basis of common understanding, although final language remained to be worked out.

The first related to the powers of the international petroleum commission established by the treaty. Industry objected to having the commission make formal "recommendations," for action by the two governments, yet conceded that reports in any form probably would have the effect of recommendations; also that some sort of definite proposals would be necessary if the industry is to get immunity from the antitrust laws in putting them into effect. Some sort of hair-splitting phraseology probably will be evolved to cover this point.

Antitrust Immunity

On the matter of antitrust immunity, the State Department was in sympathy with the industry's desire for assurance against prosecution for carrying out the proposals of the international commission. The industry agreed that such a provision probably has no logical place in a treaty but wanted it there anyway. It was left to the cabinet committee to work out some machinery for clearing contemplated action with the Department of Justice.

The definition of United Kingdom was left open for further negotiation with the British. The PIWC committee had proposed a definition which excluded all colonies, including Trinidad and other oil-producing areas, the effect being to place such oil in international rather than domestic commerce. The industry men suggested that either the definition of the United Kingdom be dropped or that a list of all areas covered be annexed to the treaty.

The PIWC reservation that either country could restrict imports of oil was also left up to the skill of the authors of the final phraseology. All agreed that no such reservation was needed because a sovereign nation always has the right to restrict imports in the absence of specific agreements to the contrary, but spokesmen for independent producers felt that inclusion of such a reservation would make the proposed treaty more acceptable in this country.

Facsimile of Drake Well To Be Built on Site

A faithful reproduction of the Drake well, which in 1859 touched off a business that now represents an investment of some 15 billion dollars, is to be built on the site of the original, near Titusville, Pa., Dr. Paul H. Giddens, curator of the Drake Well Memorial Park and Museum, told oil men at a series of meetings in Tulsa and Bartlesville last week, sponsored by Mid-Continent Oil and Gas Association.

Dr. Giddens showed slides made from 230 photographs taken by John A. Mathers, Titusville photographer, whose camera preserved for later generations thousands of early oil-field scenes. The Drake museum has about 3,000 of these pictures.

The speaker told the story of each picture, explained the work of the museum, where a rich collection of oil relics is being accumulated, and outlined plans for the future. He was introduced by Judge James A Veasey, retired general counsel for The Carter Oil Co. Clarel B. Mapes, secretary-treasurer of Mid-Continent Oil and Gas Association, spoke briefly.

On January 15 Dr. Giddens addressed the Engineers Club of Tulsa and invited guests. On January 18 he gave a talk before a meeting of oil men in Bartlesville, Okla., and the next day he discussed "Petroleum in Three Wars" before the Bartlesville Chamber of Commerce.

What Others Say:

Orlando, Fla.
January 11, 1945.

Dear Sirs:—

It is with great regret that I herewith cancel my subscription to "The Oil Men's Bible", as even Methuselah had to finally retire—to make room for the youngsters. Over 40 years ago, I subscribed to The Oil and Gas Journal, shortly after it was started by Mr. Reavis. As Illinois and Oklahoma were then the most rapidly growing oil producers, Mr. Reavis started the Journal in St. Louis, or midway between these two very active states. Later he sold out to the ancient and revered "Oil City Derrick".

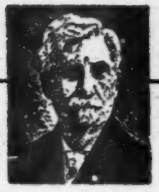
Having just wound up the Petro Oil & Gas Co., the last of my oil activities, I have retired to Florida, the old man's paradise.

The more than $200 expended in subscriptions to your Journal is insignificant compared with the invaluable information obtained from its pages. With best wishes for the continued growth and prosperity of the Journal, I remain,

Regretfully yours,

H. A. WHEELER.

To 86-year old Mr. Wheeler our thanks for his kind comments with the hope that he will enjoy many years of well-deserved rest in the "oil man's paradise." May his peace not be disturbed too much by the activities of the "younger generation" in our newest oil state.

FOUNDED IN 1910  BY PATRICK C. BOYLE the OIL AND GAS JOURNAL

A Year of Techniques

IN this issue we take a look at the details of what happened in the oil business in 1944, not because of a purely historic interest but because the immediate past is the sound base for projecting operations of this and later years.

Responding to war requirements, the domestic industry exceeded any previous year in the expansion of its operations in all divisions. The increase of 190,000,000 bbl. in crude-oil output in 1944 was more than half the production of the last year of World War I.

While this and other volume data of 1944 are impressive, it is necessary to go deeper than figures to vision the activities of an all-out war year in petroleum. The full-scale application of the industry's techniques, some of which have been years in the making, explains the year's activities.

In the matter of reserves new fields accounted for 204,650,000 bbl. of oil in place. Discovery of many of these pools was tied in with perfections in exploration practices without which they would not have been found.

Of greater immediate importance is the fact that 1,943,306,000 bbl. is credited to 1944 because of extensions, new pays and revisions in estimates of old pools. Here again improvements in operating practices were outstanding. New exploratory and drilling devices were factors in opening up for production new sands in existing fields. Cases are cited in which fields have been extended through utilization of these same methods.

A large part of last year's additions to reserves is accounted for by the simple procedure of revaluating the remaining reserves in fields which are 1 or more years old. This does not connote errors in previous estimates. It is entirely due to improved recovery practices. As a result of repressuring and pressure maintenance, water flooding, better utilization and conservation of producing pressures in the newer pools and important developments in pumping methods the recoverable oil in many fields at the end of 1944 exceeded that of 1 to 10 years ago. This, of course, is not an answer to the problem of maintaining a balance between reserves from new fields and new production, but up to now it has prevented a serious shortage in petroleum during this emergency.

In transportation practically every pipe-line system, in the movement of crude oil and products, exceeded prewar capacity by a substantial margin. Similar gains were recorded in emergency pipe-line operations. Developments in pumping equipment and practices explain this achievement.

Details of what several hundred refiners and natural gasoline manufacturers have done in processing cannot be revealed until the war is over. Operators with new methods and equipment have produced in excess of normal capacities. Their principal contribution to the war, however, has been in catalytic distillation, superfractionation and associated practices which before Pearl Harbor were confined to the laboratories, pilot plants and small commercial operations.

Some of these producing, transportation and refining arts in their commercial applications have received great impetus because of the war's needs. Others simply reveal continued progress with a background of many years of research and development on the part of operators and manufacturers of equipment. All are now an integral part of permanent techniques which will greatly widen petroleum's horizons.

Record Production Rate Set for February

WASHINGTON.—An all-time high production rate of 5,074,850 bbl. a day of all petroleum liquids has been certified to the various oil-producing states for February operations.

This represents an increase of 34,050 bbl. daily over the production certified for January 1945 and surpasses the former all-time high certification of 5,051,300 bbl. daily for September 1944 by 23,550 bbl.

The production rate certified for the eastern states (PAW District 1) remains at 68,400 bbl. daily, the same as in January.

For the Middle West states (PAW District 2) a rate of 982,650 bbl. daily was certified, an increase of 8,200 bbl. over the previous month's certification.

Crude-oil production accounted for 5,300 bbl. daily of the midwest's increase, while the remainder is attributable to an estimated increase in production of natural gasoline from expanded plant facilities in the West Edmond field.

Because of productive capacity added by continued development of the West Edmond field, the crude-oil rate certified for Oklahoma was increased by 8,000 bbl. daily, whereas Illinois, Indiana, and Nebraska were reduced by a total of 2,700 bbl. daily to conform with an indicated decline in actual productive capacity.

The production rate certified for the Southwestern states (PAW District 3) is 2,935,600 bbl. daily, or 21,800 bbl. greater than during January. All of this increase is attributed to Louisiana and Texas. The total quantity of crude oil certified for February production in Texas has increased by 16,000 bbl. to 2,290,000 bbl. daily. This increase in production in the two states is considered necessary to furnish from current withdrawals the crude oil needed to insure capacity operation of war refineries and the War Emergency Pipeline.

For California, the certified rate of 951,800 bbl. daily represents a net increase over January of 4,000 bbl. daily, with crude oil increasing by 5,800 bbl. daily and natural gasoline and condensate decreasing by 1,800 bbl. daily.

Although there has been some increase in productive capacity through new development well completions, particularly in the Elk Hills field, a portion of the total crude-oil rate certified for California still must be obtained at the expense of exceeding maximum efficient rates in some pools and fields.

PRODUCTION RATES IN BARRELS PER CALENDAR YEAR

	February 1945		January 1945	February 1944
	Certified total petroleum liquids	Estimated natural gasoline and condensates	Certified total petroleum liquids	Actual production total petroleum liquids
District 1—				
New York	13,000	.....	13,000	13,100
Pennsylvania	40,400	1,400	40,400	41,000
West Virginia	15,000	6,800	15,000	15,500
Total	68,400	8,200	68,400	69,600
District 2—				
Illinois	210,000	12,000	212,000	234,100
Indiana	12,000	.....	12,500	14,500
Kansas	279,000	5,000	280,000	279,100
Kentucky	35,800	3,800	34,800	26,000
Michigan	47,850	850	47,600	54,400
Nebraska	1,000	.....	1,200	900
Ohio	8,500	500	8,350	8,600
Oklahoma	388,500	28,500	378,000	359,100
Total	982,650	50,650	974,450	976,700
District 3—				
Alabama	300	.....	300	.....
Arkansas	85,200	5,200	84,900	84,400
Louisiana	397,000	37,000	391,000	377,900
Mississippi	53,000	.....	53,000	43,700
New Mexico	110,100	5,100	110,600	119,600
Texas	2,290,000	150,000*	2,274,000	2,040,000
Total	2,935,600	197,300	2,913,800	2,665,600
District 4—				
Colorado	9,500	.....	9,500	6,900
Montana	23,300	300	23,350	24,500
Wyoming	103,600	3,600	103,500	90,900
Total	136,400	3,900	136,350	122,300
District 5—				
California	951,800	58,000†	947,800	871,100
Others	.....	.....	.....	200
Total U.S.	5,074,850	318,050	5,040,800	4,705,500

*Includes 16,000 bbl. daily average separator condensate over and above anticipated plant production. †Includes 6,200 bbl. daily average Paloma condensate production.

East Texas Operators Say Pool May Be Damaged

AUSTIN. — Fears of East Texas operators that the pool may be permanently damaged were increased last week when the Texas Railroad Commission assigned another producing day to the field, effective this month. The original order for January provided 24 producing days. The change was made in response to a directive from Petroleum Administration for War that 16,000 bbl. more of East Texas crude be produced daily, the additional output to start at once.

East Texas operators frequently have complained that rising demand for oil from that pool would result in injury to the field and have asked that increases to meet war requirements be assigned to other areas, particularly West Texas.

PAW asked that the increase be from East Texas "because limitations with respect both to transportation and refining facilities do not permit further shifting or additional movements of sweet crudes from other areas into the Longview terminal of the War Emergency (big-inch) pipe line which must be kept operating at full capacity, and because crude stocks available in the East Texas district have been practically exhausted."

The state-wide allowable for February will produce an estimated 2,303,762 bbl. daily, about the current rate, but 13,000 more than PAW requested. Of the 13,000 bbl. the commission said 10,000 are distillates and natural gasolines, whose production is prorated.

The February order cuts about 17,000 bbl. daily from a score of West Texas fields producing sour crudes, principally Slaughter, Wasson and Yates, to put that district in line with PAW recommendations.

Hawkins field in East Texas was reduced nearly 5,000 bbl. a day because of transportation difficulties.

Capt. Leonard Cox Reported Missing in Pacific Action

Capt. Leonard Cox, formerly in the advertising department of The Oil and Gas Journal, was reported missing in action January 14 while on a bombing mission in the Pacific theater. Captain Cox had been awarded the Distinguished Service Cross, Distinguished Flying Cross, and Air Medal with three oak leaf clusters. His B-29 outfit was based on Saipan.

British Pipe-Line System Handling 100,000 Bbl. Daily

MORE than 100,000 bbl. of petroleum daily currently are being transported between British ports, storage areas and supply depots through a 1,000-mile pipe-line system, existence of which was confirmed only last week by British officials.

"Since 1941," said Geoffrey Lloyd, secretary of Britain's ministry of fuel and power, "we have constructed an elaborate interconnecting pipe-line system 1,000 miles long, and it is studded with scores of secret underground storage tanks capable of holding large reserve stocks. Already, no less than 2,400,000,000 gal. of oil have been carried to the principal centers of consumption, especially airfields."

During recent months 5,000,000 gal. (119,000 bbl.) of petroleum were carried daily. The pipe line cost about £7,000,000 ($28,000,000) and 80,000 tons of steel were used in construction, according to British Information Services, New York, through which details about the line were released.

The line has facilitated delivery of more than 383,050 liquid tons of petroleum products which the British war office handed over to the U. S. ground forces, under reverse lend-lease, between January 1 and June 30, 1944. It is reasonable to suppose that 50 per cent of these quantities went towards the operational stock pile for the invasion of France.

The first part of the network to be laid down was a line to link the southwest oil ports with the London area. This pipe line was not intended for aviation spirit, but it furnished help by leaving the British railways free to carry increasing quantities of aviation fuel. The terminal depot opened on December 5, 1941, 6 months after the preliminary work on the line had been started.

The next part of the plan was the linking of the oil ports of the northwest coast, and this was achieved by a pipe line from this area running south to join the first line.

Facilities for pumping in either direction were provided and storage depots were linked into the pipe line.

Linked to Invasion Bases

For the needs of D-day, the next move was to make these new facilities available by linking what were to become invasion bases. In the early summer of 1942, a spur from the original line was run to the south coast. Forty miles of the line, started May first, began operating June 30.

The plan provided for lines running from the west coast ports handling incoming tankers. These lines linked to form an aviation-gasoline circuit over 350 miles in length. In building this circuit, all types of country were encountered, and one stage of the line crosses terrain well over 1,000 ft. above sea level. Work on the circuit started on October 1, 1942, both lines from the western ports began operating in March and the circuit was completed by the end of August, 1943. A considerable number of important storage depots were linked into the circuit and it is now the life line of the air arm stretched from this country to pound the Reich.

1943 Extensions

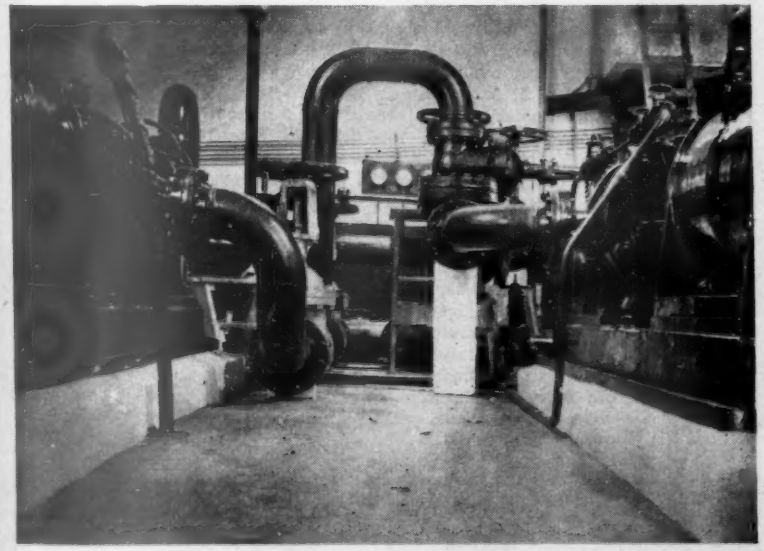
In the fall of 1943, further extensions to the pipe-line system in the south and east of England were undertaken, partly to meet special air force needs and partly for the continental requirements of the Allied armies. The shortest of these extension lines runs for 22 miles and the longest for about 120. Another is nearly 100 miles in length, and all were in operation by the middle of March, 1944.

Routes were chosen across the open country wherever possible so that the fullest use might be made of mechanical excavators. Agricultural interests were closely watched. On an average, a right-of-way of 15 to 20 ft. wide only was affected, and this only for a comparatively short time. In trenching, the top soil was removed and kept separate from the subsoil so that on completion the top soil was again replaced on top of the trench, and farming could continue uninterrupted as soon as the laying of the line was completed.

Many physical difficulties—water obstacles and rivers by the score have been crossed, ranging from large tidal estuaries, middle reaches of substantial rivers, to upper reaches of those rivers into small brooks and drainage ditches a few feet wide. With the enormous demand for steel for all war purposes, speed of laying was limited by deliveries of pipe from the mills.

The maximum laid in one week was 18 miles of 10-in. line. The best sustained effort was 125 miles both of 10 and 8-in., in 84 days. More than half the system consists of 8-in. pipe and more than a quarter of 10 in. The short stretches of spurs consist of 12, 8 or 4-in. line. Practically all the pipe lines are designed to work at a pressure of 600 p.s.i. This pressure enabled the comparatively light steel to be used.

Britain's pipe-line system had to be built without welders, as none could be spared from the shipyards. In place of welded joints, special couplings are used. These allow a certain amount of expansion in the line. Where only welded joints could stand the strain of pressure, "anchors" are used. These anchors are small concrete piers through which the lines run at points where it bends, and relieves the joints of all abnormal strain. The pumps used are nearly all of the centrifugal type driven by electric motors.



Interior of one of the oil-pumping stations

Dr. Anderson Resigns From A.P.I. Technical Staff

NEW YORK.—Dr. R. P. Anderson, technologist on the staff of the American Petroleum Institute and secretary of the refining division, has retired after more than 20 years of service. He joined the institute staff in 1924 after studying and teaching chemistry at Cornell University for 13 years and serving as chief chemist for United Natural Gas Co. for 7 years at Oil City, Pa.

DR. R. P. ANDERSON

His career with the A.P.I. covered numerous technological activities relating to petroleum, not only within the institute but also in the American Society for Testing Materials, American Standards Association, Coordinating Research Council, Inc., International Standards Association, National Fire Protection Association and other organizations.

For the immediate future Dave Stroop will serve as acting secretary of the division of refining.

Wescoat Heads New A.P.I. Committee on Highways

NEW YORK.—Lee S. Wescoat, vice president of Pure Oil Co., is chairman of the new committee on highways which William R. Boyd, Jr., president of American Petroleum Institute, has named in conformity with action taken by the institute's executive committee at its meeting in Washington last month. Bert I. Graves, vice president of Tide Water Associated Oil Co., is vice chairman, and David V. Stroop, of the A.P.I. staff, secretary. The committee will concern itself chiefly with highway planning and engineering materials used in road improvement; interregional, express and "super" highways; roads, streets and bridges; highways for commercial vehicles; highways in relation to other public improvements; highway safety; traffic control.

DEATHS

William Larkin, 63, president of Larkin & Co., Butler, Pa., died in a Pittsburgh hospital January 18. His brother, John J. Larkin, president of Larkin Packer Co., died in St. Louis last October.

Hollis P. Porter, 70, retired consulting engineer and author of "Petroleum Dictionary," died January 22 in Tulsa. Porter entered the oil business as assistant chief engineer for Gulf Oil Corp., later becoming chief engineer, superintendent and then engineering consultant for the old Gypsy Oil Co., a Gulf subsidiary. He invented a separator used to flow wells at low pressure.

W. C. Norris, 83, president and founder of W. C. Norris, Manufacturer, Inc., Tulsa, and a pioneer in production of oil-field equipment, died January 22 in Washington, D. C. He divided his time between Washington and Tulsa. When he started his first shop in Tulsa he employed eight men.

Mark Kleeden, 53, oil promoter, who retired from active management of his properties 5 years ago owing to ill health, died January 15 in Oklahoma City. His wife had died less than 24 hours before.

John D. Collins, 53, director-in-charge of District 1, Petroleum Administration for War, died January 20 at Great Neck, L. I. Before taking his PAW post last June Collins was a director and vice president in charge of sales of Tide Water Associated Oil Co. Petroleum Administrator Harold L. Ickes and Deputy Administrator Ralph K. Davies characterized Collins death as "a serious loss to PAW."

James E. Wade, 73, retired oil producer, died January 19 in Tulsa, where he had resided since 1906. He was a director of the old Central National Bank.

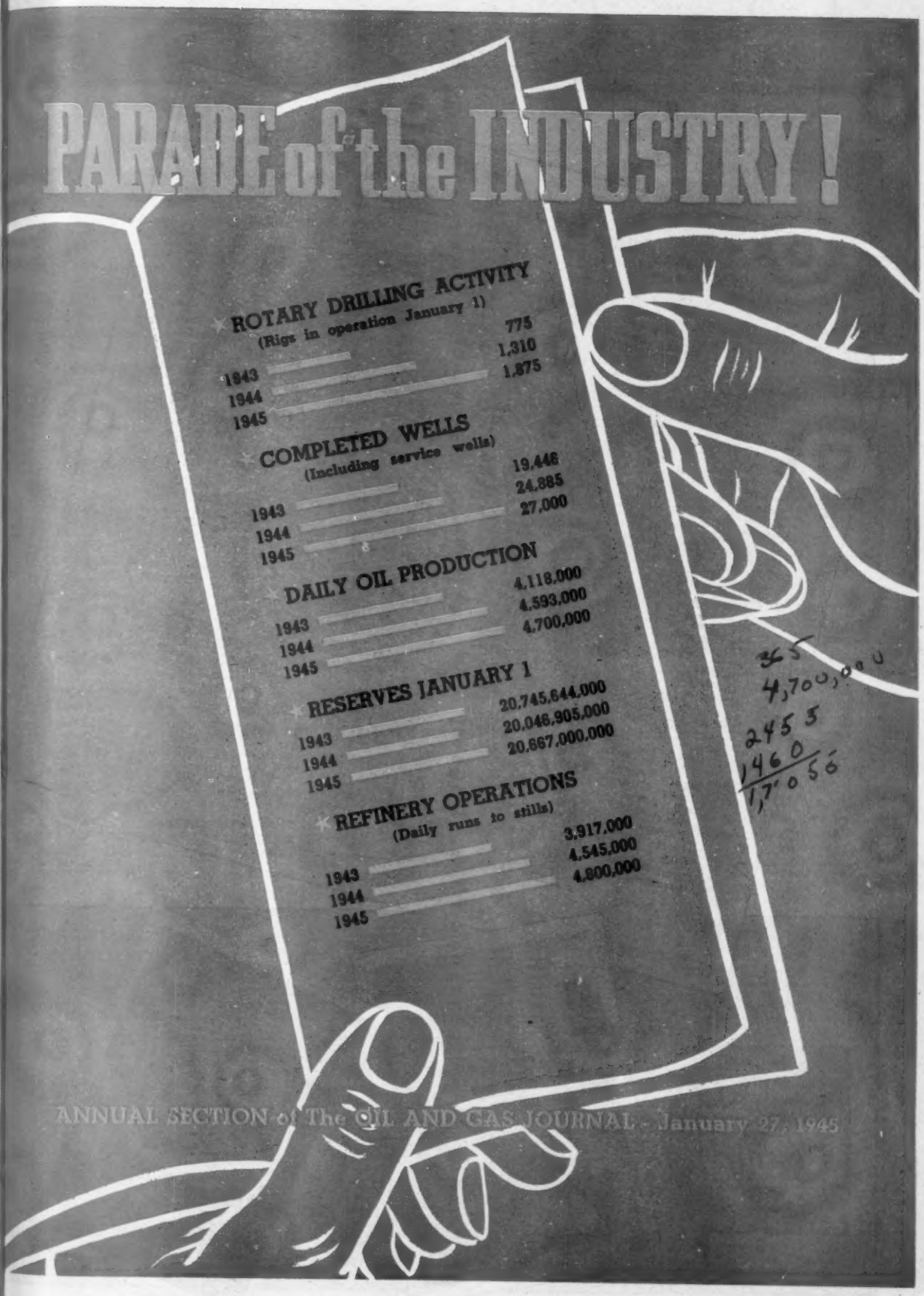
Herbert R. Macmillan, 68, vice president and general counsel of Macmillan Petroleum Corp. for 21 years, died January 13 in Los Angeles. He had served as president of California Oil and Gas Association and conducted extensive drilling operations of his own.

Norman R. Putnam, 54, active oil man for many years, died January 15 in Tulsa. He organized Mileage Gasoline Co., then was president of Water White Gasoline Co., leaving that organization to become field superintendent for Pure Oil Co. At the time of his death he was sales manager in the southwest district for A. M. Byers Co.

Robert S. Roche, 52, petroleum engineer in the division of works and buildings, Naval Department, Ottawa, Canada, died January 11. For 17 years Roche, a native of New Zealand, was a consulting petroleum engineer in Tulsa, and he left that city in 1942 to report to Royal Canadian Air Force for topographical duty.

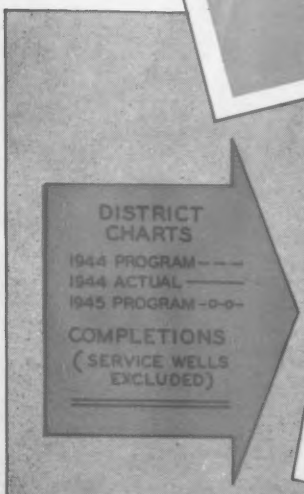
The Journal's appreciation is extended to the numerous individuals and organizations assisting in the assembly of forecast and statistical data presented in this Annual Section.

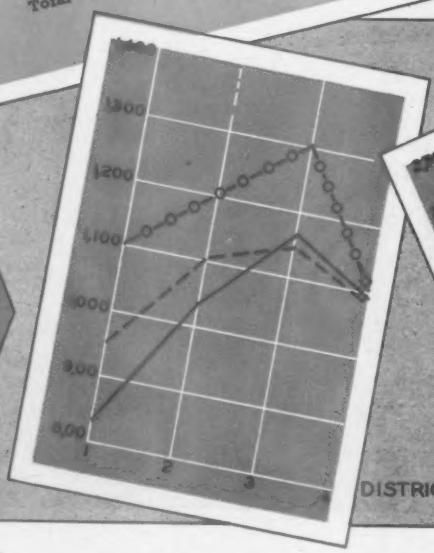
Differences in the break down between field and wildcat wells in the drilling forecast, page 170, and the totals on development and exploratory completions, pages 172 and 173, result from dissimilarity in classification by individual companies. The forecast is based on replies from companies which drilled as many as 80 per cent of the wells in some areas and their individual classifications were accepted on wildcats and field wells. Thus, a deflated development-well total and an inflated exploratory figure are reached. Most companies apparently classified their wells on the basis of hazards involved, resulting in an exploratory total which included deeper and shallower-pay field tests, stratigraphic tests and service wells.

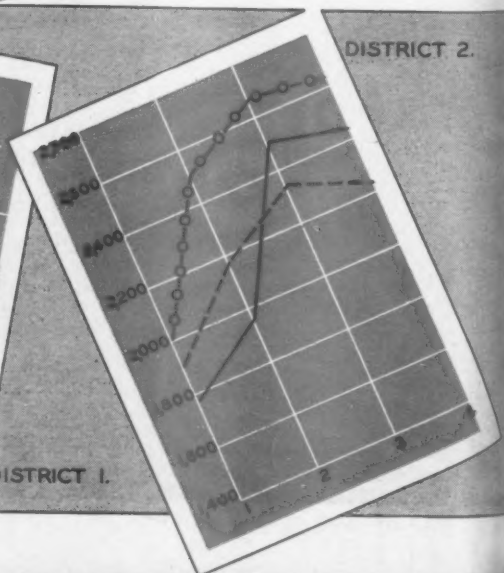

PARADE of the INDUSTRY!
ROTARY DRILLING ACTIVITY
(Rigs in operation January 1)
1943 775
1944 1,310
1945 1,875
COMPLETED WELLS
(Including service wells)
1943 19,446
1944 24,885
1945 27,000
DAILY OIL PRODUCTION
1943 4,118,000
1944 4,593,000
1945 4,700,000
RESERVES JANUARY 1
1943 20,745,644,000
1944 20,046,905,000
1945 20,667,000,000
REFINERY OPERATIONS
(Daily runs to stills)
1943 3,917,000
1944 4,545,000
1945 4,800,000
ANNUAL SECTION of The OIL AND GAS JOURNAL - January 27, 1945

Industry Plans 12.5 Per Cent More Wells

	Twelve months, 1944				Projected operations, 1945				Footage (thou. feet)	
	Total wells completed				Wells programed					
	Rotary	Cable	Field wells	Wildcat wells	Rotary	Cable	Field wells	Wildcat wells	1944	1945
Alabama	24	10		34	19		19		168	139
Arizona	1	1		2				4	4	
Arkansas	209	6	159	56	81		61	30	488	
California	2,034		1,613	421	2,158		1,782	376	1,190	7,985
Colorado	35		9	9	63		40	23	7,527	316
Florida	8			27	28			28	200	274
Georgia	5		1,488	8					80	
Illinois	1,949		262	5	91				31	4,171
Indiana	303			461	1,385	9	1,027	367	4,958	493
Iowa	2		1,181	193	63		133	60	581	
Kansas	1,548	289	847	41	28				6	4,856
Kentucky	601	392	595	2	2			489	6,194	1,643
Louisiana	803		244	1,253	1,158	392	1,176	114	1,863	9,743
North	329		351	123	392	417	617	239	5,724	3,713
South	474	234	401	254	377		811	81	1,406	6,030
Michigan	421		106	50	5		355	158	4,315	2,375
Mississippi	156				304		456	292	1,820	2,969
Missouri	24		24	26			326	117	776	7
Montana	387		361	5	474	228	280		94	370
Nebraska	7	98	2	96			5	45	946	
New Mexico	316	327	316	20			250		30	2,827
New York		1,023	307	512	1,386			106	1,322	544
Ohio	1,848	244	1,558	332			414	51	528	1,400
Oklahoma	1			1		48	282	54	2,730	7,338
Oregon	1	3,856	3,051	806		333	417	334	7,172	
Pennsylvania	5			5		471	1,301		7	15,418
South Dakota						249		357	6,510	14
Tennessee	5,561	168	4,294	1,435	5,204	9,210	8,853		11	4
Texas	308		204	104	464			1		
East Texas	1,529	34	1,085	478	1,389	290	1	1,233	28,821	30,555
N. & W.C. Texas	474		185	289	451		4,261	128	1,807	3,004
South Texas	682		529	153	698	132	336	363	4,395	4,303
Lower Gulf	89		53	36	174		1,028	226	2,009	2,211
S.C. Texas	719	18	543	176	741		225	141	4,448	5,293
Upper Gulf	294	116	295	17	211	35	557	64	303	1,227
Panhandle	1,466		1,400	182	1,296	133	110	182	5,043	5,589
West Texas	2		2				559	7	984	756
Utah	202	2	1,235	1,124	174	1,789	1,207	222	7,572	8,170
West Virginia	5	2,354	26			3	239		7	
Wyoming	3	179					1,623	166	3,000	3,733
Total	16,257	9,005	18,517	8,745	14,970	13,436	23,819	25	907	782
								4,587	80,746	98,852







FORECAST

THE PETROLEUM industry proposes to drill nearly 28,500 wells in 1945. Vacillations in equipment supplies will govern achievement of the program. Granted more liberal supplies, the industry would exceed the 28,500 total because numerous respondents to the Journal's questionnaire expressed the desire to expand their drilling programs if equipment and manpower permit.

The increase of approximately 12.5 per cent in drilling revealed by the Journal's independent survey over actual completions in 1944 is largely concentrated in seven states. The most substantial increase for the entire country apparently will occur in Pennsylvania where the 1945 program calls for a three-fold rise. The Pennsylvania program includes service wells and indicates a significant expansion in water flooding operations. Declining production in Pennsylvania and the 75-cent subsidy which will carry over indefinitely are the factors prompting a much more vigorous development program in the eastern states.

California, Colorado, Florida, Louisiana, Mississippi, and New Mexico are other states in which more extensive drilling will occur, according to the consolidated reports from individual companies at end of the year. Most companies reported that currently programed drilling will depend on supplies of equipment. It is obvious that operators will experience difficulty in fulfilling their drilling plans unless the War Production Board and its military advisers make the necessary adjustments.

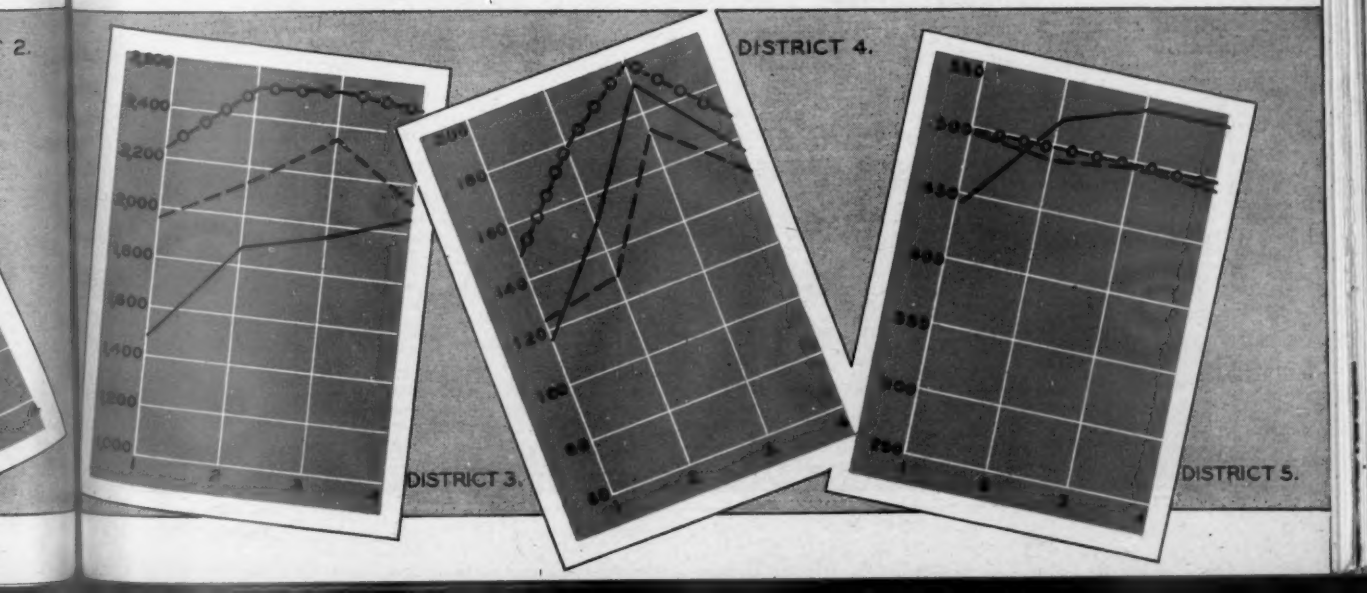
Projected operations in Texas which last year accounted for 22 per cent of the nation's completed wells will be substantially unchanged. The percentage factor, of course, will decline slightly in Texas if all other areas accomplish their goals. The most significant aspect of projected drilling operations in Texas is the expectation that the 5,594 programed wells will require drilling more than 30 million feet of hole. During 1944, when Texas operators completed 5,729 wells, a total of 26.6 million feet were drilled.

Work planned next year follows a logical trend based on requirements and productivity of existing fields. The increase in California, for example, is essential to support continued high withdrawals and to enhance output for more intensive phases of the Pacific war yet to complete.

The actual forecast of 28,406 wells to be drilled this year correlates surprisingly closely with the minimum goal of 27,000 set by the Petroleum Administration for War. Detail by PAW districts, however, varies substantially from the forecast, being particularly incongruous in District 1. No allowance has been made in the PAW program of 1945 drilling for service wells in District 1. Thus, part of the difference can be justified between the total of 4,700 wells programed by PAW and the Journal's report which forecasts 11,361 wells in the eastern states. Normally, service wells in Pennsylvania, New York and West Virginia account for 50 per cent of total completions. Consequently, the indicated increase in 1945 confirms the assumption that secondary-recovery operations will be substantially expanded this year.

Operators in the Middle West and Mid-Continent (District 2), expected to drill 9,800 wells in the PAW schedule, reported to the Journal that 6,800 completions were anticipated for the year. Some of the more substantial operators in District 2, however, have not completed their 1945 budgets and qualified their replies, asserting that tentative figures are subject to revision.

There is no assurance that operators will exactly follow their drilling programs projected in January throughout the year. In fact, most of the major companies with 100 to 400 wells on their operational schedules pointed out that programs are purposely made flexible in order to meet unpredictable developments. In the case of large companies, however, the over-all drilling appropriations are carried through without substantial variation. This practice means that discovery of a new field and subsequent rapid development may impose drilling obligations which could not be forecast at the start of the fiscal year. In such cases, the large companies shift their drilling programs to meet exigencies and defer a compensatory number of wildcat or development wells in areas where there is no compulsion to drill.



A 29.7 PER CENT increase in total completions brought the industry's 1944 record up to 25,262 wells drilled, including service wells in the eastern area. Excluding the 2,156 input wells in that area, which are not included in the Petroleum Administration for War's 1944 program of 24,000 wells, the industry completed 23,106 development and exploratory wells, or 96 per cent of the PAW quota.

The Oil and Gas Journal's count of wildcat completions shows that 3,618 tests were drilled during the year, about 90 per cent of the PAW suggested quota. This was an outstanding showing, considering the many problems, particularly manpower troubles, that affected the exploration branch of the industry throughout the year. It was accomplished, in the opinion of some executive geologists, at the expense of quality, due to spreading of the efforts of experienced geologists and geophysicists over too many tests in too short a time.

One of the outstanding features of the 1944 drilling campaign was the large number of completions in the old eastern area. Including Ohio, these states accounted for almost 30 per cent of all the wells drilled in the country, and showed an

DEVELOPMENT COMPLETIONS BY STATES

State—	Comp.	Oil	Gas	Dry
Eastern	6,843	2,510	1,422	*2,811
Ohio	925	189	437	319
Indiana	370	140	22	108
Kentucky	893	357	305	231
Michigan	429	227	56	146
Illinois	1,870	1,174	6	490
Mississippi	84	72	0	12
Alabama	15	9	83	6
Kansas	1,346	775	3	488
Neb.-Mo.-Iowa	19	12	189	373
Oklahoma	1,517	955	235	863
Texas	4,454	3,356	15	372
N. Central	1,151	764	24	35
Eastern	176	117	13	92
West	1,394	1,289	44	31
Panhandle	302	227	2	7
S. Central	33	24	26	101
South	302	175	58	118
Upper Gulf	558	382	53	107
Lower Gulf	538	378	81	186
Louisiana	672	405	66	80
Northern	255	109	15	106
Southern	417	296	2	26
Arkansas	153	125	58	49
Montana	324	217	3	5
Wyoming	152	144	0	2
Colorado	17	15	12	55
New Mexico	341	274	41	131
California	1,820	1,648		
Total	21,644	12,594	2,955	6,105

*Includes 2,156 service wells.

WILDCAT COMPLETIONS BY STATES

State—	Comp.	Oil	Gas	Dry
Ohio	98	2	23	73
Indiana	33	4	0	29
Kentucky	100	17	0	83
Michigan	226	12	3	211
Illinois	279	22	1	257
Mississippi	72	6	0	65
Alabama	19	1	0	18
Ga.-Florida	13	1	0	12
Kansas	491	49	10	432
Neb.-Mo. Iowa	14	0	0	14
Oklahoma	373	76	23	274
Texas	1,275	170	33	1,072
N. Central	412	74	0	338
Eastern	132	34	5	120
West	188	0	3	152
Panhandle	10	2	0	7
S. Central	56	9	6	54
South	172	20	4	157
Upper Gulf	161	24	13	107
Lower Gulf	144	24	1	106
Louisiana	131	10	1	63
Northern	74	14	0	43
Southern	57	3	0	59
Arkansas	62	4	5	54
Montana	63	23	2	28
Wyoming	53	7	1	12
Colorado, Utah	20	9	3	61
New Mexico	73	15	7	182
California	214	0	0	9
Miscellaneous*	9			
Total	3,618	445	112	3,061

*Arizona, Oregon, South Dakota.

COMPARISON OF DRILLING RESULTS, 1944 VS. 1943

	Total completions			Oil well completions			Gas well completions			Dry hole completions		
	1944	1943	Per cent change	1944	1943	Per cent change	1944	1943	Per cent change	1944	1943	Per cent change
Texas	5,729	4,421	+29.6	3,526	2,373	+48.6	269	140	+91.4	1,935	1,908	+ 1.4
California	2,824	1,447	+49.8	1,662	1,150	+44.8	48	30	+60.0	322	267	+21.0
Louisiana	803	672	+19.5	429	336	+27.7	82	72	+13.9	292	265	+10.2
Oklahoma	1,690	1,184	+33.0	1,031	543	+89.8	212	92	+130.4	447	549	+17.9
Kansas	1,837	1,735	+ 5.9	824	880	— 6.4	93	36	+158.3	920	819	+12.3
Illinois	1,943	1,751	+11.3	1,196	1,046	+14.3	6	12	—50.0	747	693	+ 7.8
New Mexico	414	251	+64.9	283	182	+55.5	15	7	+114.3	116	62	+87.1
Wyoming	205	133	+54.1	157	103	+63.7	5	6	—16.7	33	25	+32.0
Arkansas	215	242	—11.5	128	137	— 6.5	2	3	—33.3	85	103	—17.5
Nine-state subtotal	15,676	11,836	+27.4	9,247	6,749	+37.0	731	398	+83.7	5,098	4,691	+ 8.7
Eastern (inc. Ohio)*	7,506	4,659	+61.4	2,661	2,032	+31.0	1,882	816	+130.6	3,003	1,811	+65.8
All other states	2,080	2,980	—12.1	1,101	936	+17.6	454	683	—33.5	1,065	1,361	—21.7
Total United States	25,262	19,477	+29.7	13,008	9,717	+34.1	3,067	1,897	+61.7	9,166	7,863	+16.6

*Includes service wells in eastern area.

increase over the preceding year of 62.4 per cent.

Aside from this eastern area, the drilling was concentrated pretty much in proportion to the production of the various states, although not exactly so. Texas, first in production, was first among the noneastern states in completions. The state's 5,729 completions give it a 29.6 per cent increase over 1943, almost exactly in line with the nation-wide total of 29.7 per cent. California, second in production, was also second of the noneastern states in completions, 2,034 wells giving it a 40.6 per cent increase over 1943. Oklahoma, owing in part to the concentrated drilling at West Edmond, completed 1,890 wells, a 59.6 per cent increase over 1943, almost twice the nation-wide average increase. Illinois had a substantial year in 1943 and in 1944 topped it by only 11.3 per cent. New Mexico and Wyoming, with relatively small total numbers of completions, showed increases of 64.9 and 54.1 per cent respectively.

Distribution of Drilling

The eastern area accounted for 30 per cent of the total wells completed. The nine leading oil-producing states accounted for 60 per cent. The remaining 10 per cent are scattered among all the other oil-producing states plus a few wildcats in nonproducing states.

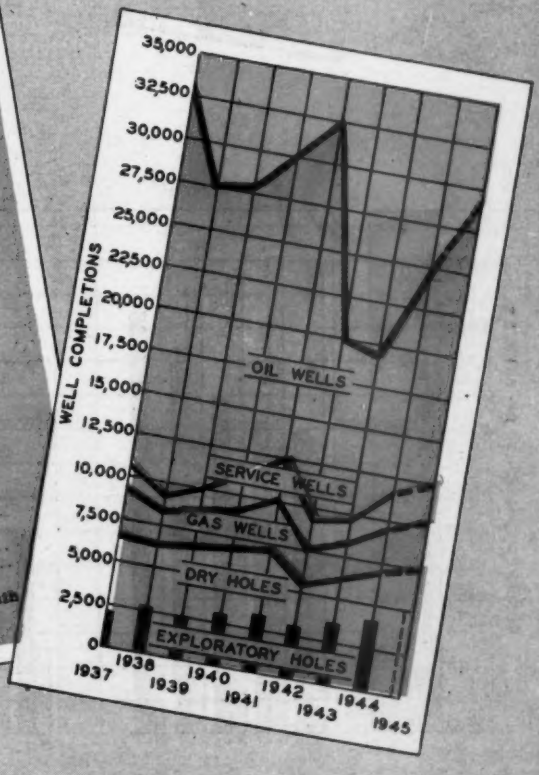
The record shows that of the 3,618 tests classified as wildcats, 11.5 per cent found oil, 3.1 per cent found gas and 85.4 per cent were dry holes. On the other hand, drilling in so-called proven territory was obviously not without hazards. Excluding the eastern area with its high ratio of input wells, but including Ohio, the record shows that of 15,101 wells classified as development wells, 23.1 per cent were dry holes. Therefore, about one out of every four so-called proven locations turned out to be dry. However, the record shows that a well classified as a development well has 5¼ times better chance of finding either oil or gas than a wildcat, because 76.9 per cent of the field development wells found oil or gas, as against only 14.6 per cent of the wildcats.

To shed what statistical light may be available on the controversy as to the effect of wide-spacing regulations on dry hole chances, the detailed statistical tables on completions in other sections of this issue, carry the records by months both of field development and wildcat wells by areas, as well as the completion records for the year by fields.

TOTAL UNITED STATES COMPLETIONS BY STATES

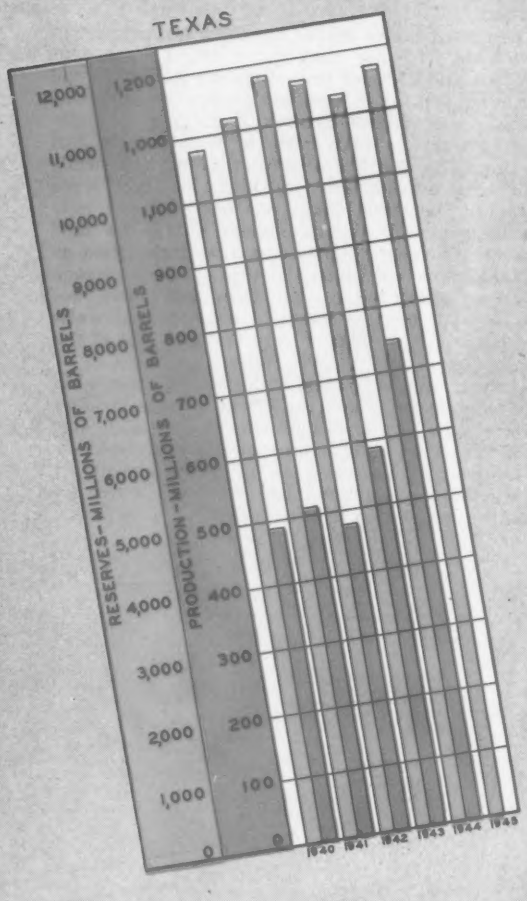
State—	Comp.	Oil	Gas	Dry	Avg. footage	Total comp. 1943
Eastern	6,543	2,510	1,422	*2,611	1,874	4,859
Ohio	1,023	171	460	392	2,868	979
Indiana	303	144	22	137	1,916	247
Kentucky	833	374	395	314	1,878	656
Michigan	655	239	59	357	2,473	628
Illinois	1,949	1,196	6	747	2,543	1,751
Mississippi	158	78	1	77	5,613	115
Alabama	34	16	0	24	4,928	8
Georgia-Florida	13	1	93	12	6,127	9
Kansas	1,837	624	3	929	3,372	1,735
Neb.-Mo.-Iowa	33	12	212	18	1,633	67
Oklahoma	1,890	1,031	288	647	3,794	1,184
Texas total	5,729	3,526	15	1,935	4,858	4,421
North Central	1,583	836	29	718	2,811	1,551
Eastern	308	124	15	155	6,061	310
West	1,582	1,223	47	244	4,786	891
Panhandle	312	227	2	39	3,153	200
South Central	89	28	32	61	3,407	82
South	474	194	62	258	4,238	404
Upper Gulf	718	402	66	255	7,013	513
Lower Gulf	662	492	62	214	6,521	471
Louisiana total	893	429	67	232	7,127	673
Northern	329	119	15	143	4,280	313
Southern	472	310	2	149	9,104	360
Arkansas	215	128	62	85	5,532	243
Montana	367	221	5	103	2,445	240
Wyoming	295	167	1	33	4,423	193
Colorado, Utah	37	22	15	14	5,401	31
New Mexico	414	283	48	118	3,194	251
California	2,034	1,043	9	323	3,700	1,447
Miscellaneous†	9	0	0	9	4,077	0
Total 1944	25,282	13,023	3,067	*9,188	3,234	19,477
Total 1943	19,477	9,717	1,897	*7,863	3,250	.....
Total 1942	18,150	8,501	2,099	*7,550	3,158	.....
Total 1941	32,140	19,761	3,014	*8,365	3,065	.....
Total 1940	30,048	19,269	2,300	*8,471	3,049	.....
Total 1939	25,839	17,194	2,031	*7,614	.....	.....
Total 1938	27,149	18,003	1,993	*7,102	.....	.....

*Includes inputs for eastern area. †Arizona, Oregon, South Dakota.



PRODUCTION

by Charles J. Deegan

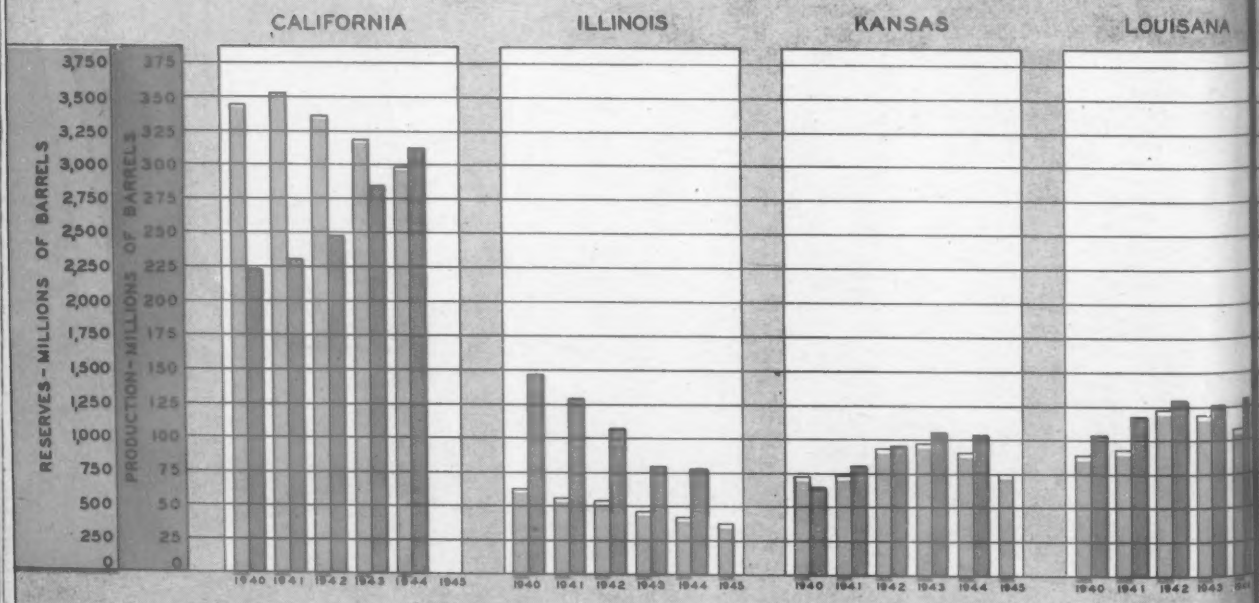


DOMESTIC crude-oil production hit an all-time peak in 1944, totaling in round numbers 1,685,000,000 bbl., an increase of 190,000,000 bbl. over 1943. Texas and California combined accounted for 185,000,000 of the increase, and for almost 63 per cent of the total production during the year. All other states combined produced about 37 per cent of the year's total and on net balance, showed about 5,000,000 bbl. increase over 1943.

Daily average production for the U. S. at the end of the year, at 4,718,000 bbl. per day, was 360,000 bbl. per day higher than at the beginning of the year. Indications from Washington were that war demands would continue high and perhaps even expand, which would mean that unless the European war ends sooner than now anticipated, 1945 may see new peaks in production.

Aside from Texas and California, the next four states in point of volume continued to be Louisiana at 135,000,000 bbl., Oklahoma 123,000,000 bbl., Kansas 100,000,000 bbl., and Illinois 77,000,000 bbl. This was the same relative order in which they ranked as producers in 1943. During the year, however, both Kansas and Illinois showed signs of slipping, Louisiana increased its production slightly and Oklahoma, due to the West Edmond field, came up with a rush, opening the year 1945 by nosing out Louisiana for third place in daily production. For 1945, the prospects are that Illinois will continue to decline or at best hold stationary with a strenuous drilling campaign. Kansas is badly in need of some favorable pools for quick development and at the moment they do not appear to be in sight.

In Louisiana, the prospects for increased production in the southern part of the state are good, particularly if material, rigs and manpower are available for the increased development. There are also potential developments in the east central part of the state, generally classified as Northern Louisiana, but which geologically now seems to



belong to the Mississippi salt dome trend. The prospects for 1945 are that Louisiana may be able to increase its production and give Oklahoma a real race for third place.

In Oklahoma, high hopes are held that 1945 will see it regain third place among the oil-producing states. These hopes are based largely on the West Edmond field and further developments in the Anadarko basin.

In California, increased production is expected to reach a peak by June or July, when Elk Hills will have reached the 65,000-bbl.-per-day goal set by the government. Whether the Navy will then decide to continue drilling operations at a pace just sufficient to sustain production, or curtail drilling, will determine the trend of the state's production in the last 6 months.

Prevailing restrictions on production may be further relaxed late this year if the current demand for petroleum from the West Coast continues. The production committee is attempting to produce fields where the least damage will be inflicted and a careful check is periodically made to determine bottom-hole pressures and ascertain the rate of decline.

Consistent drilling will be necessary to arrest the normal decline and if this drilling is concentrated in highly productive fields it will probably result in meeting the production goals.

In the Rocky Mountain area, prospects for increased production in 1945 are especially favorable in Colorado and Wyoming, while Montana operators will have to drill many development wells to hold their own.

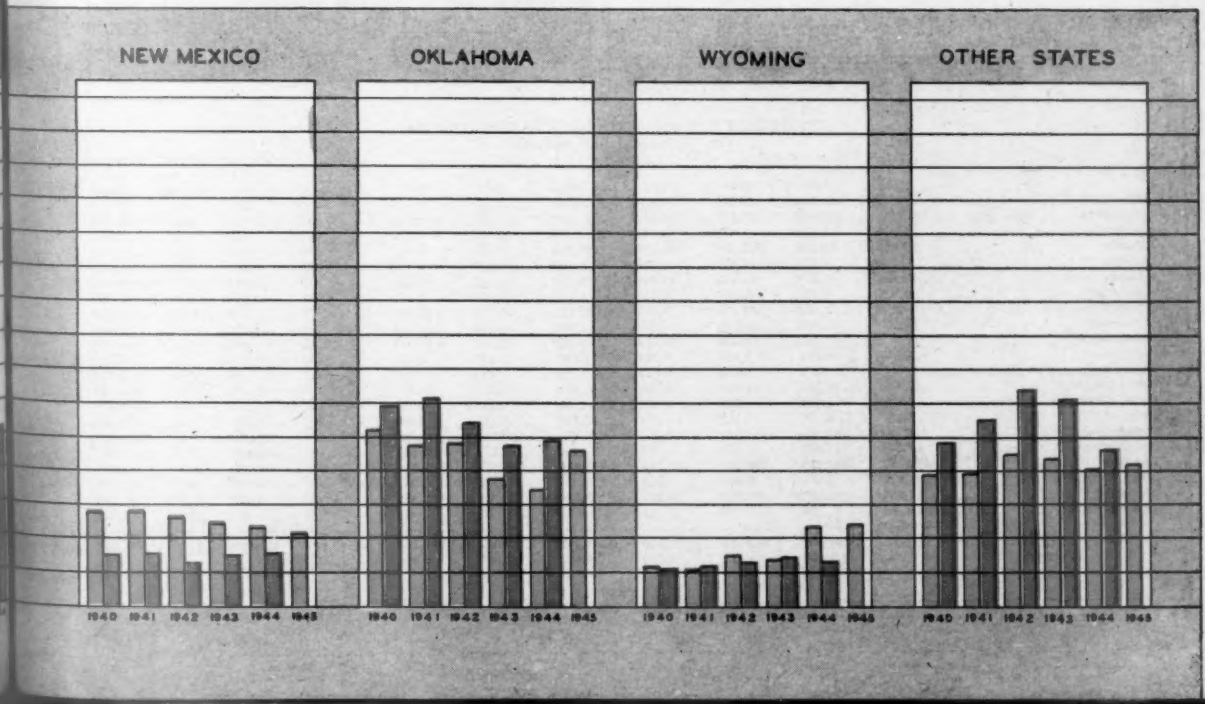
Colorado showed an increase during 1944 due to the development of the Wilson Creek and Rangely fields, the two largest in the state. At the beginning of 1945, operators in both fields were preparing for an increase in drilling in anticipation of the completion of pipe-line facilities to handle the production. The Rangely field looks like the largest field in Colorado's oil history, and if it measures up to indications more pipe-line outlets will be required.

Wyoming is expected to go ahead on a more extensive scale by development of the many new pools opened in 1944 and the increased pipe-line facilities. The potential production from the known discoveries in the Big Horn, Wind River and Green River basins is such that for the next several years increased production will largely depend on a program of constructing pipe lines to maintain a balance with the drilling program.

For 1945, the limits in Wyoming will not be determined by lack of good locations to drill. During this year there should be no difficulty in keeping production ahead of transportation outlets, if the rigs, material and manpower are allocated to this territory.

New Mexico produced 39,751,000 bbl. during 1944, a very slight increase. During the last half of the year, an important upward turn was in evidence in its productive possibilities, with upper Permian production discovered in the Turner area and lower Permian pay found on the east flank of the Penrose field. Discovery of Ellenburger production in southeast Lea County also increased the potential importance of Ordovician production. However, the prospects for any great increase in production in Southeast New Mexico during 1945 are, as always, hinged on the situation in West Texas. With pipe-line outlets all running eastward, Southeast New Mexico is the most western shipping point, and it must wait its turn as long as West Texas has more productive capacity than pipe-line outlet.

Although substantial increases in production were registered in West Texas during 1944, as a result of increased transportation, the potential production still exceeds the outlets. During the year, pre-Permian and lower Permian exploration, although expensive and deep, established substantial



PRODUCTION

potential production from the Devonian lime in Andrews, Crane and Ector counties. West Texas will produce all the oil in 1945 that can be transported with existing and prospective facilities, and still retain a substantial reserve of productive capacity.

In eastern Texas, production gained during the year, chiefly owing to development in proven fields, particularly New Hope, along with Hawkins, Manziel, Quitman, Pittsburg and Long Lake. Several discoveries were made in 1944 that may have substantial future prospects with more drilling. The East Texas field still dominates the area, and with the increased return of water to the sand the operating techniques in the field are resulting in the recovery of large volumes of oil with very slight declines in reservoir pressures. This year should see steady increases in production in eastern Texas.

In the Gulf Coast, continuance of the present rates of production and increases during 1945 will be largely a matter of how much development work can be carried on. While some fields are undoubtedly strained, perhaps being overproduced, there are sufficient prospects in new pays, new extensions and newly discovered fields to maintain and probably increase the present production, if a sufficient number of wells can be drilled during 1945.

In Mississippi the development of Heidelberg and Eucutta, plus Cranfield and the newer discoveries did not get under way early enough to overcome the decline at Tinsley. The result was that the total production for 1944 showed a decrease of 2,363,000 bbl., although production at year's end was 5,000 bbl. per day higher than at the start. During 1945 a continued expansion of production should take place, but the depth of the wells, complex production problems, and lack of transportation outlets, make Mississippi's future a matter of growth measured in years before its full potentialities are realized.

All other states combined will probably show some further decline in 1945. For the country as a whole, increased production during 1945 is not only possible, but probable, unless the European war ends suddenly and results in substantial curtailment of military demands. The areas of probable declines are more than offset by the areas of potential increases.

DAILY AVERAGE CRUDE-OIL PRODUCTION IN U.S. AND NUMBER OF PRODUCING WELLS

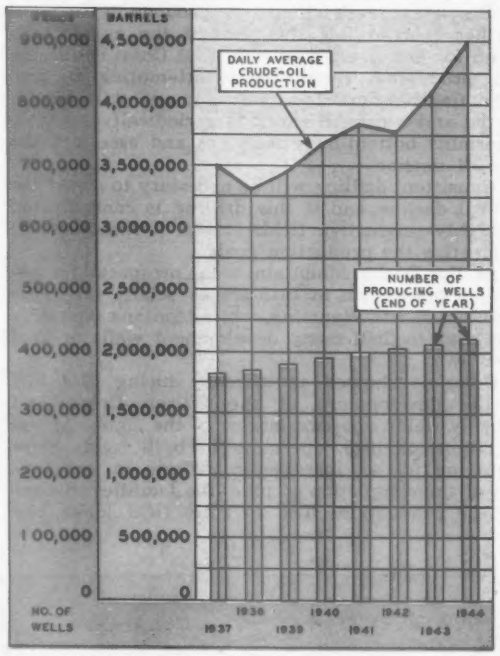


Chart adapted from PIWC economics committee report on oil-industry trends

PRODUCTION IN UNITED STATES, 1938-44
(In thousands of barrels)

	1938	1939	1940	1941	1942	1943	1944	Change	Producing wells 1-1-45	Daily avg. bbl. per well	Cumulative prod.
Arkansas	18,357	21,383	26,072	26,301	26,570	27,606	29,116	+ 1,510	3,132	25.3	636,415
California	249,930	235,493	223,104	230,317	247,132	294,286	311,798	+ 27,512	21,457	39.7	6,665,801
Colorado	1,324	1,415	1,412	1,734	2,300	3,431	3,933	+ 502	182	45.5	77,597
Illinois	23,800	92,203	146,494	128,550	105,590	77,637	76,987	— 650	23,869	8.8	1,086,669
Indiana	961	1,711	4,978	6,536	6,600	5,343	5,119	— 224	2,180	9.2	147,482
Kansas	80,135	80,973	84,932	91,899	98,870	105,687	99,857	— 5,840	26,250	10.4	1,348,647
Kentucky	5,234	5,021	5,188	4,811	4,189	7,891	9,602	+ 1,711	14,454	1.8	159,547
Louisiana	94,855	94,182	103,410	117,834	128,231	125,780	135,406	+ 9,626	7,714	47.9	1,553,557
Michigan	19,180	23,563	19,733	16,215	21,748	20,535	18,159	— 2,376	3,371	14.7	222,061
Mississippi	.....	107	4,400	16,224	27,545	18,868	16,505	— 2,363	462	97.6	94,165
Montana	4,825	5,873	6,383	7,344	8,045	7,841	8,875	+ 1,034	2,050	11.6	114,208
Nebraska	.....	2	276	1,713	1,276	814	460	— 354	70	17.9	4,714
New Mexico	36,000	37,872	39,466	39,588	31,914	38,924	39,751	+ 827	4,122	26.3	421,542
New York	5,045	5,006	4,980	5,125	4,988	4,313	4,738	+ 425	21,787	0.6	148,617
Ohio	3,297	3,156	3,150	3,294	3,663	3,185	2,968	— 217	23,429	0.3	586,303
Oklahoma	160,307	152,400	149,629	153,167	137,792	120,559	123,436	+ 2,877	51,192	6.6	5,330,855
Pennsylvania	17,449	17,832	17,353	16,422	17,624	18,751	18,553	— 1,198	82,826	0.5	1,062,705
Texas	470,760	482,235	499,183	561,348	477,828	589,129	747,214	+158,085	99,477	20.5	8,943,681
West Virginia	3,725	3,580	3,444	3,378	3,482	3,158	3,309	+ 151	16,783	0.5	426,872
Wyoming	19,956	21,207	28,232	30,009	32,736	34,765	33,462	— 1,303	3,833	23.9	632,720
Miscellaneous	60	94	71	62	57	57	55	— 2	9	16.7	1,326
Total	1,200,875	1,236,060	1,340,020	1,391,920	1,307,277	1,495,371	1,685,204	+189,833	409,629	11.3	29,887,464
Daily average	3,290	3,428	3,671	3,813	3,801	4,097	4,804	+ 507	.....	.....	.....

REFINING

*by A. P. Frame**

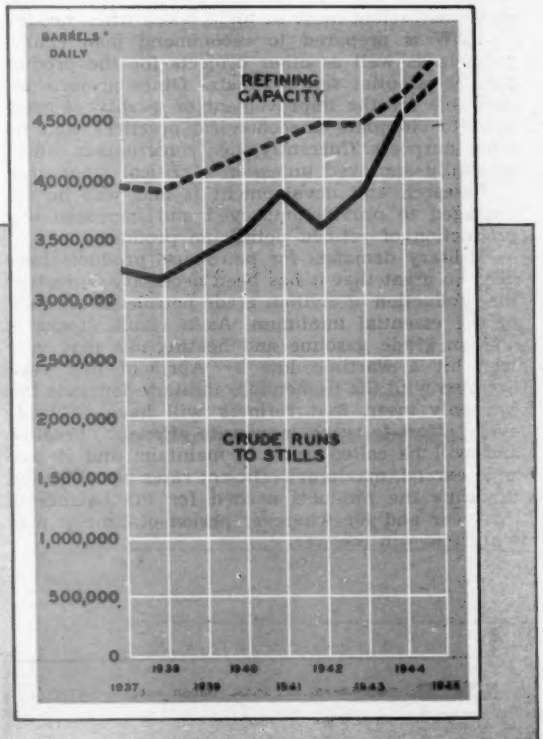
WASHINGTON.—Looking into the future for refiners is largely a matter of looking at full production until final victory.

When the enemy is defeated, refiners can undertake some "time-table planning," but until such a goal has been achieved, it is, in my opinion, unwise to look beyond the foreseeable future to a subject filled with question marks, namely, postwar planning.

In the foreseeable future, our most pressing need is aviation gasoline, despite the fact that the petroleum industry has thus far met military requirements for this fuel in all combat areas. The industry has done an excellent job. But now military requirements, according to the most recent estimates received by the Petroleum Administration for War, are expected to soar to new heights. This means that the refining branch of the industry will have to surmount the seemingly insurmountable task of producing even greater quantities of aviation gasoline with the facilities and manpower available.

Currently, production of 100-octane aviation gasoline is more than 12 times the immediate prewar production and is approximately equal to one-third the total gasoline of all grades normally consumed in the United States. Present production is four times the ultimate requirements as estimated on December 15, 1941, and 25 per cent in excess of ultimate requirements as estimated after a year at war.

*Director of refining, Petroleum Administration for War.



The greater part of the major 100-octane producing units called for in the PAW-sponsored program have been built and are in operation. There still remain three major units to be finished at domestic plants for the production of high-octane gasoline authorized before 1944. These are very close to completion.

This means that out of the original construction program of 189 units approved before 1944, 99 per cent of the domestic work is complete.

During 1944 one large domestic construction project for the production of 100-octane was approved. The production from this plant was originally considered as a safety factor but, in view of the extremely critical situation in regard to aviation gasoline, early completion of this plant is now urgent. Fortunately some production can be obtained in the first half of 1945, and the plant probably will be finished by the end of this year.

Despite this unprecedented large-scale construction program, the capacity of the plants already built, together with those still under construction, will not meet the estimated requirements of the armed forces. The prospective shortage of 100-octane gasoline makes additional efforts to increase the output necessary.

The first and most obvious thing to do is to increase the production at existing facilities. Most of the problems here fall in the fields of operating and labor.

Refining production, although on the increase during the last few months, has not reached the capacity rate of the plants producing aviation-grade gasoline. On stream, the plants have met or exceeded guarantees, but the shortage of maintenance labor is now seriously reducing the capacity of many units.

Oil refinery equipment is difficult to place in operation. Once placed on stream, however, operation is nearly automatic with the result that only a few skilled operators are required to make occasional adjustments and guard against mechanical disturbances.

Modern refining units are often run day and night for as long as four or six months without stopping. At the end of this time the slow accumulation of dirt and coke in the unit and wear on equipment make further operation inefficient or unsafe.

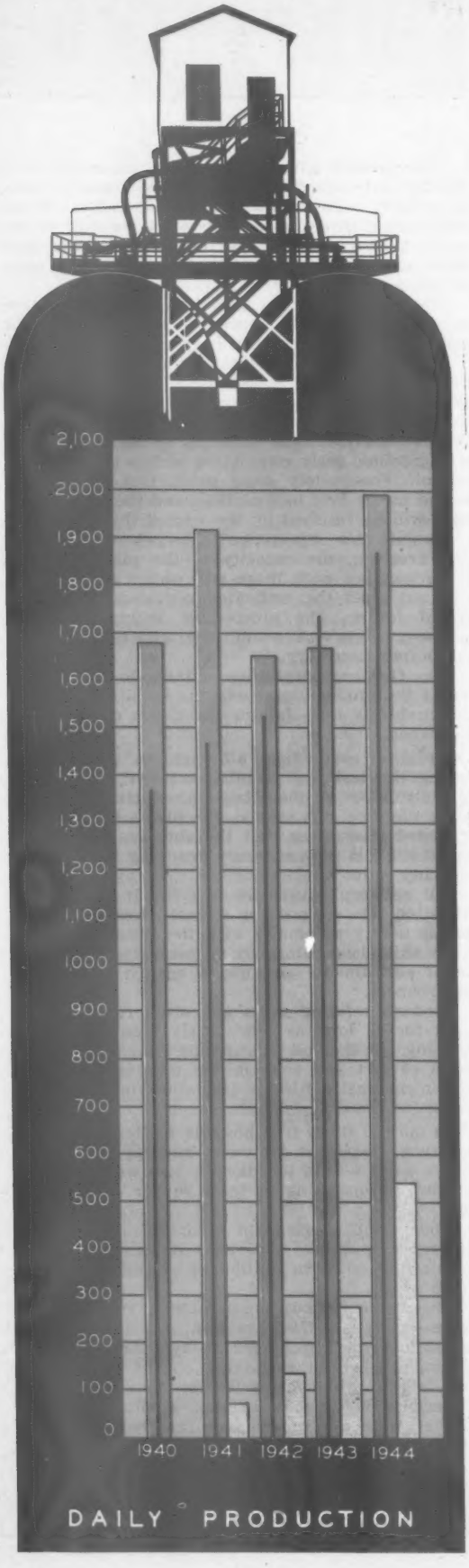
In normal times it is possible to clean a unit of this type, inspect it for wear, and repair any defective parts within ten days or two weeks so that the unit is operating at least 90 per cent of the time.

Today, the shortage of labor for maintenance and repair purposes plus slow delivery of repair parts often results in shutdowns extending through 4 or 5 weeks.

This down time is comparable to the repair of battle damage to Navy vessels, and it goes without saying that prolonged delays that result in fighting equipment remaining out of combat are more helpful to the enemy than to our fighting men.

Because of the acute aviation-gasoline situation, I have confined my discussion largely to the 100-

REFINING



octane programs. Projects which contribute directly to the relief of the aviation-gasoline shortage are being promptly approved and, in general, materials and labor are being made available.

However, there is a large backlog of other construction desired by the refining industry.

In addition to getting maximum production from all existing plants, it will also be necessary to construct new facilities to meet the high military requirements. Small expansions of existing plants, which will remove bottlenecks and increase production of refined petroleum products in a few months, are being encouraged in every way. To meet the long-term demand, construction is also being rushed on several new plants of major size, and additional projects are being considered.

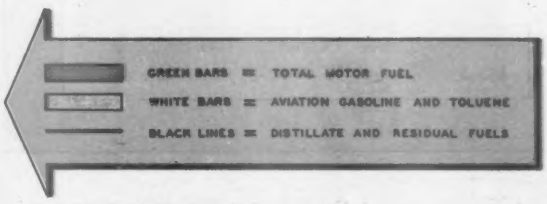
Most of the processes for the production of 100-octane were new at the beginning of the war. Experience and actual operation has shown that the addition of equipment can in many instances result in an appreciable increase in production. These minor additions frequently can be erected in a few months. The highest priority given to projects, AA-1, will be granted to these bottleneck removals. If this priority rating does not secure desired delivery of equipment, the PAW is prepared to recommend directives or other specific action by the War Production Board as needed.

In general, because of the shortage of labor this is not the time to commence construction. However, it would be short-sighted policy not to build units needed to insure the continued production of essential war products. The changing crude situation and the changing demands for products will continue to make construction necessary to preserve the present position. Since no one knows when the war will end construction must be undertaken when needed.

PAW is prepared to recommend maintenance projects as well as other projects for the production of essential war products. Other projects are desirable for the improvement of quality of products, to eliminate uneconomical practices, and for other purposes. Currently such construction can be generally approved unless in a critical labor area.

Research and development is and will be encouraged to provide improved and increased war production of refined petroleum products.

Military demands for petroleum products have been so great that it has been necessary to restrict the production of civilian grade petroleum products to the essential minimum. As a result, stocks of civilian grade gasoline and heating oils may very well hit a wartime low by April of this year. Coupled with the tremendous military demands this can only mean that refiners will have to make every effort to reach maximum efficient operation and will be called upon to maintain, and if possible exceed, maximum efficient rates of operations to refine the products needed for the balance of this year and for whatever period of time it may require to win the war.



NATURAL GASOLINE

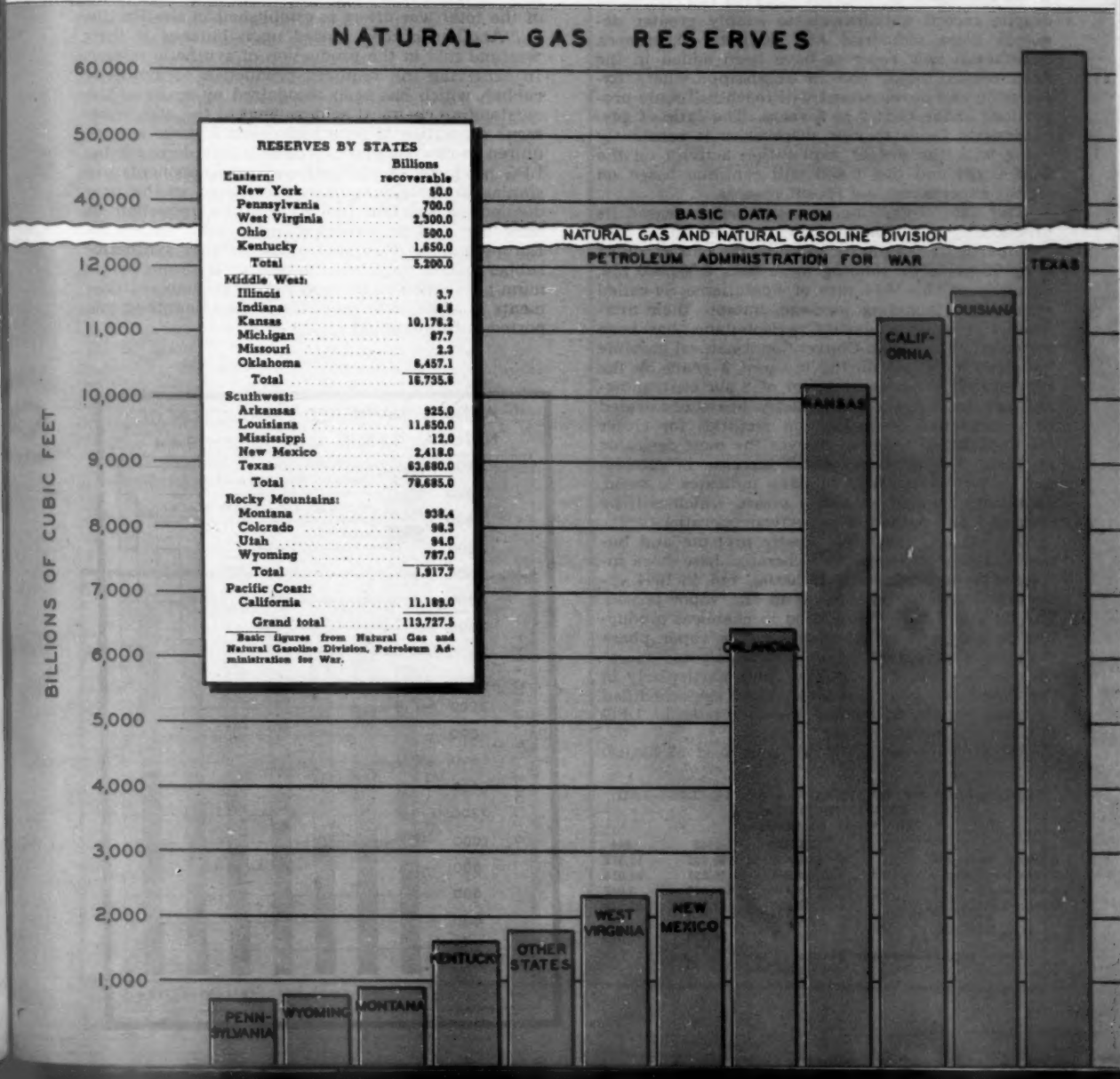
by H. Stanley Norman

PLANT expansion is imminent in the natural gasoline, cycling and pressure-maintenance operations of the industry. The extensive construction program which will average expenditure of approximately $3,000,000 per month during 1945 is urgent because of the expanding requirements for liquefied petroleum gases in the aviation-gasoline, synthetic-rubber and chemical programs for the duration.

Much emphasis currently is directed at increasing production of isobutane and butane-butene mixtures in order to engage maximum capacity of the country's alkylation and isomerization plants. The program for increased yield of LPG is coordinated with refinery construction where the demand this year for isobutane and butane probably will exceed 60,000,000 bbl. Substantially all of the increased butane productivity of the natural-gasoline industry is earmarked for diversion to the war program and all of the isobutane is so channeled.

The growing importance of natural-gasoline and cycle products is causing a reappraisal of natural-gas reserves. Contributing also is the recent announcement that a commercial process has been developed for production of motor fuel from dry gas at a cost of 5 cents per gallon, narrowing the competitive expense factor by approximately 7.5 cents per gallon. Previous estimates calculated the cost of producing motor fuel and related products from natural gas by the conventional Fischer-Tropsch process at 12.5 cents per gallon.

Technical developments, consequently, are has-



RESERVES BY STATES

	Billions recoverable
Eastern:	
New York	80.0
Pennsylvania	700.0
West Virginia	2,300.0
Ohio	500.0
Kentucky	1,650.0
Total	5,200.0
Middle West:	
Illinois	3.7
Indiana	8.8
Kansas	10,176.2
Michigan	87.7
Missouri	2.3
Oklahoma	6,457.1
Total	16,735.8
Southwest:	
Arkansas	925.0
Louisiana	11,850.0
Mississippi	12.0
New Mexico	2,418.0
Texas	63,680.0
Total	78,885.0
Rocky Mountains:	
Montana	938.4
Colorado	98.3
Utah	94.0
Wyoming	787.0
Total	1,917.7
Pacific Coast:	
California	11,189.0
Grand total	113,727.5

Basic figures from Natural Gas and Natural Gasoline Division, Petroleum Administration for War.

tening the commercial application of processes for complete utilization of natural gas, both from dry gas fields which may be shut in for lack of market outlets and from petroleum reservoirs from which gas is produced as an inherent result of producing oil. Criticism is growing more severe of oil producers who have made no effort to conserve gas in their major operation of recovering crude oil. The Bureau of Mines has estimated that the loss and waste of natural gas incident to production of oil and as residue at natural-gasoline plants totals 600 billion cubic feet annually. The only deterrent to extensive installation of pressure-maintenance operations in fields where gas wastage is most flagrant is the current critical shortage of compressors, tubular goods and the other facilities required in such work. Enhanced value of natural gas both as a raw material for liquid products and as fuel is considered adequate to support the economics involved.

Expansion of natural-gas reserves has continued despite record withdrawals to supply greater demands from industrial and domestic consumers. Substantial new reserves have been added in the deep coastal fields and in Mississippi where exploration and development will reach full-scale proportions in the next 2 or 3 years. The ratio of gas-condensate fields to new discoveries is constantly rising with the deeper exploration activity on the Gulf Coast and this trend will continue based on logical expectation and recent records.

The natural-gasoline industry has increased its production approximately 20 per cent since 1942 with particular emphasis on isobutane output which is up 79 per cent, totaling more than 5,000,000 bbl. annually at the 1944 rate of operations. So-called other LPG, including propane, butane, their mixtures and isomers, excluding isobutane, has been increased 39 per cent. Conventional natural gasoline has been increased during the past 3 years by the comparatively moderate factor of 8 per cent, showing how intensively the industry has concentrated its construction operations on facilities for closer fractionation in order to recover the most desirable products. The relatively small increase in production of normal natural gasoline indicates a trend, manufacturers and engineers assert, which will be sustained and extended in postwar operations.

Use of LPG fractions, mostly propane and butane-butylene mixtures, as a chemical base stock increased to approximately 12,000,000 bbl. in 1944, including deliveries both in liquid and vapor phases. The bulk of LPG volume used in chemical production is delivered to the plants in the vapor phase via pipe lines originating at natural-gasoline operations in the field. Several new lines, particularly in the Texas and Louisiana Gulf Coast, are scheduled for construction to expand the deliveries of LPG to chemical plants during 1945.

Refiners are estimated to have used 55,400,000 bbl. of petroleum products in the LPG range during 1944, an increase of 50 per cent. Synthetic-rubber operations, mostly butane-butene mixtures are estimated to have required nearly 5,000,000 bbl. in 1944, an increase of 270 per cent. Paul K. Thompson, chief, liquefied petroleum gas section, natural-gas and natural-gasoline division, PAW, recently summarized a report by a LPG survey joint subcommittee in which he said:

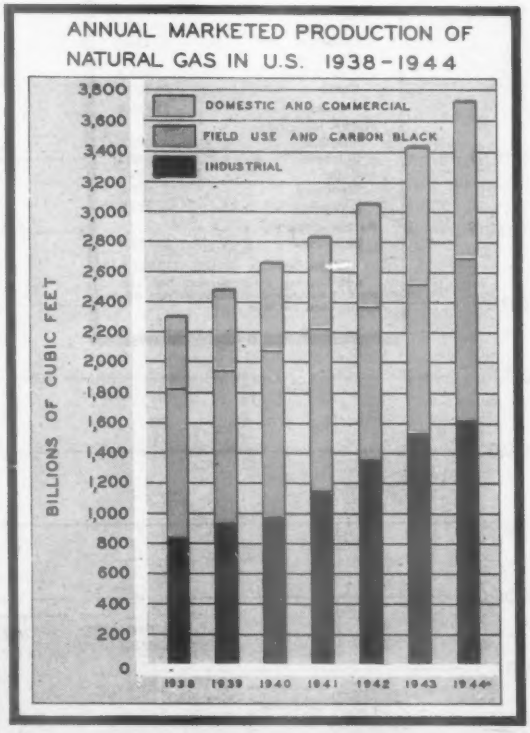
"In the production of newer, better and greater quantities of aviation fuel and to continue to meet essential military and civilian requirements of various fuels and other petroleum products, large quantities of LPG are being used in refinery operations. . . . This large use of LPG in refinery operations can be expected until total victory. The termination of the war in Europe should not bring any reduction in the manufacture of key aviation-fuel components such as isooctane alkylate even though the total production of finished aviation fuel may be temporarily reduced until the concentration of the total war effort is established in the Pacific.

"Another burden placed upon butanes is their wartime role in the production of synthetic rubber. In achieving the required production of synthetic rubber, which has been recognized by many as the outstanding chemical achievement of the war, enormous quantities of light hydrocarbon gases are required as raw material. . . . The future demands for LPG products for synthetic-rubber components are similar to those previously mentioned in the production of aviation fuel in that no reduction in their use can be expected until total victory in Europe and the Pacific. . . . The nation's synthetic-rubber plants may be expected to continue maximum production to fill backlogs of civilian requirements in addition to replacing large amounts of imported natural rubber. . . ."

PRODUCTION OF NATURAL GASOLINE, LPG AND CYCLE PRODUCTS
(Thousands of barrels)

	1942	1943	1944
Natural gasoline	48,848	48,232	52,578
Cycle products	15,846	16,257	20,013
Isobutane*	2,814	4,053	5,047
Other LPG	18,059	19,638	22,337
Total	83,567	88,179	99,975

*From natural-gasoline plants.



MATERIALS

by Claude P. Parsons*

CONTRARY to the optimistic expectations of a few weeks ago, the military uncertainties and setbacks in Europe at the end of 1944 and the acceleration of the war in the Pacific have caused a drastic change in the materials situation as we enter 1945. In general, as long as the present military uncertainties continue in the new year it will be more difficult to obtain materials for petroleum operations than in any previous period of the war.

Attention must be given to supplying the greatly increased demand for crude petroleum to keep the refineries operating. This means that exploration, drilling, production, pipe lines and other means of transportation, natural gas and gasoline, must be coordinated with the demand for finished petroleum products.

At the beginning of 1945 there are 1,800 rotary drilling rigs in operation in the United States, as compared with 1,300 at the beginning of 1944. From a materials viewpoint, this increased drilling program may run into countless difficulties.

Oil country tubular goods, especially, may become a serious problem beginning in the second quarter. The serious situation will continue in subsequent quarters unless remedial means are found.

A measure of the possible extent of the conflict is shown in the following tentative figures for the second quarter, for seamless and electric weld tubular goods (figures in tons): Military requirements, 329,200; petroleum requirements, foreign and domestic, 332,000; total requirements, 661,200; total capacity of mills, 516,000; shortage, 145,200.

If additional facilities cannot be obtained and if the impact must fall upon the petroleum program, it will mean that tubular goods will be available for only 3,400 new wells in the second quarter as compared with a program of 6,900.

Deliveries of internal combustion engines from manufacturers show improvement and the outlook for 1945 is more favorable than 1944. The November deliveries of drilling engines (over 500 cu. in. displacement) totaled 249 compared with 232 in October and 179 in September.

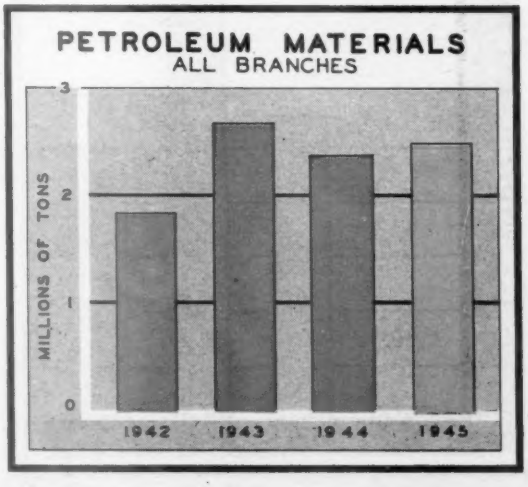
Tool joint deliveries are increasing. Production is expected to progressively increase through March when the last of the new machinery for the expansion program will be installed. December production was 34,529 as compared with 25,107 in April. The backlog of orders is still tremendous.

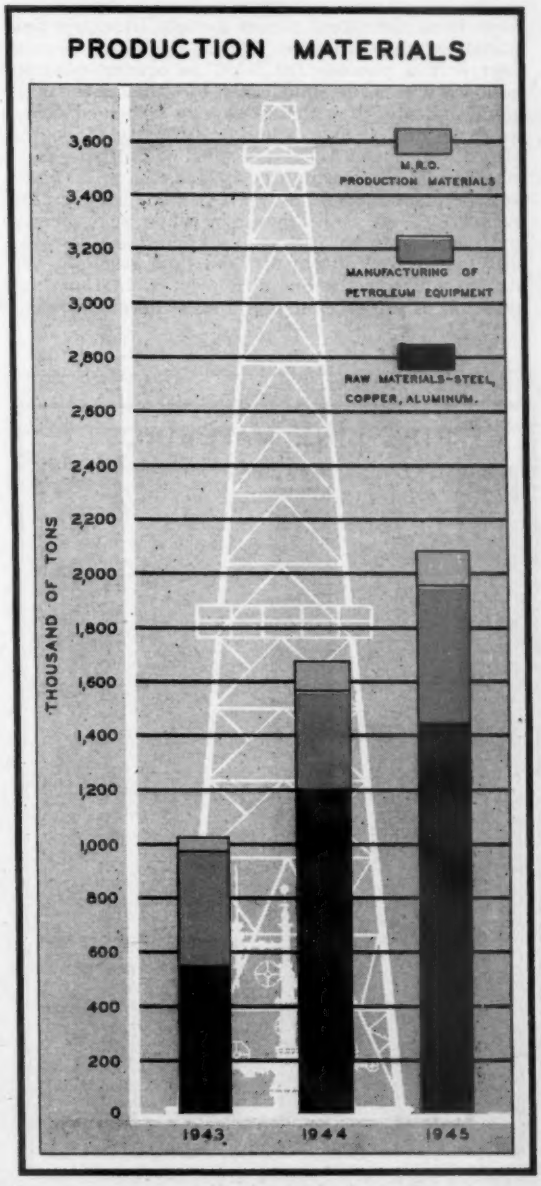
The drill-pipe situation will be improved by the increase of tool joints but it may be adversely affected by the conflict with the military in the pipe mills.

Tractors of the track-laying type are still critical due to tremendous military demands but we have received an allocation for 1945 that is a slight improvement over 1944.

The truck situation looks generally more favorable in 1945 than it was in 1944 with the exception

*Director of Materials, Petroleum Administration for War





that new heavy trucks will be seriously affected by the shortage of tires.

From present indications petroleum operations will receive approximately 15 per cent less lumber in the first quarter. Petroleum equipment manufacturers are being assisted by Petroleum Administration for War expediters in getting additional machinery and the critical components needed for the completion of their manufactured products.

Refining and Transportation

Due to the military situation in Europe, the War Production Board has adopted a realistic attitude that as long as the present military uncertainties exist, construction of new facilities will be authorized only in compliance with the provisions of the directive for war-time construction, and those in the board who are concerned with construction have been instructed to not deviate from the provisions of this directive. During the latter part of 1944 it was possible for PAW to process projects which were border-line cases but this new tightening indicates that such cases may be denied. However, we do not expect undue difficulty in having projects approved for the removal of bottlenecks in major projects covering the construction of facilities for the manufacture of ingredients and blending agents for 100-octane gasoline, when such agents and ingredients are necessary to maintain the presently authorized output of 100-octane gasoline. We also do not expect undue difficulty in obtaining the approval of projects for pipe lines where additional capacity is needed to handle the output of oil fields which do not now have adequate facilities, and for pipe lines to serve newly discovered fields.

Boilers are becoming more critical due to the structural shapes, plates and tubes becoming more difficult to obtain. Fabrication after receipt of materials does not present a problem at the present time, nor do boiler accessories.

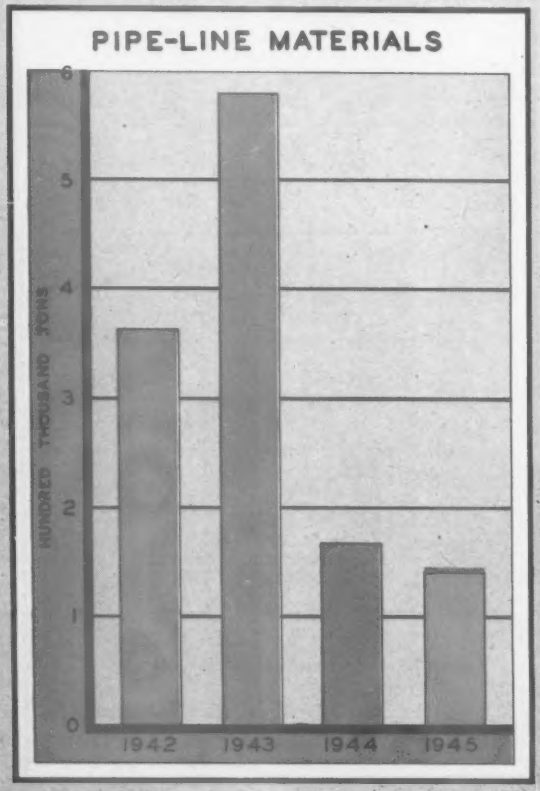
Pumps do not present any particular difficulty directly but a long lead time is required for motors needed for electrically driven pumps. Therefore, if early delivery is essential, consideration should be given to other types of drive, such as the steam turbine.

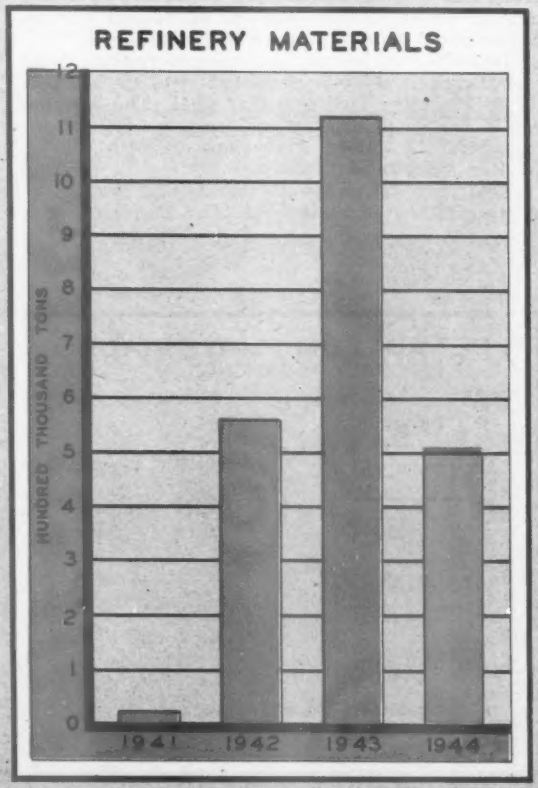
Steel plate, heads and heat exchangers are favorable but pressure vessels are presenting somewhat of a scheduling problem in certain plants.

Industrial instrument manufacturers in general are in fairly good position and the general lead time is from 4 to 8 weeks, depending upon the complexity of the instrument desired.

The situation in the electronics field is subject to considerable variation. Electronic components such as tubes, condensers, resistors, etc., can be obtained without too much difficulty. However, assembled equipment such as radio receiving and transmitting equipment, electronic test equipment and transformers are tight.

If military demands for trucks, tanks, airplanes, and ships increase, it is obvious that there will be an accompanying increase in demand for petroleum products to keep mechanized units in operation.





RESERVES

by Charles J. Deegan

THE most important single question in the minds of the oil industry's executives this year has been this: "What has been the effect on our total proven reserves in the United States of the greatly increased production rates required by the demands of war?"

The answer is that although newly discovered fields added only 204,650,000 bbl. to the reserves, extensions and new pays in previously discovered fields, and revisions in older fields in the light of sustained performance have added 1,943,306,000 bbl. The combined new reserves of 2,147,982,000 were more than sufficient to balance against record production of 1,680,000,000 bbl. and leave a net proven reserve on January 1, 1945, of 20,514,739,000 bbl., an increase of 467,834,000 bbl. compared to January 1, 1944.

These reserves, however, are not as high in proportion to the current rate of production as those to which the industry is accustomed. This accounts for the constant worry about proven reserves throughout the industry for the past 2 years. Over a period of years, an economic ratio of 13.8 times the year's production seems to have been established as an equilibrium point. Above this ratio, oil men worried about overproduction; below this ratio, they worried about discovering new reserves. The present reserves are 11.5 per cent below this ratio, and in normal times would prompt the industry to raise prices and drill wells as rapidly as possible to restore proper balance.

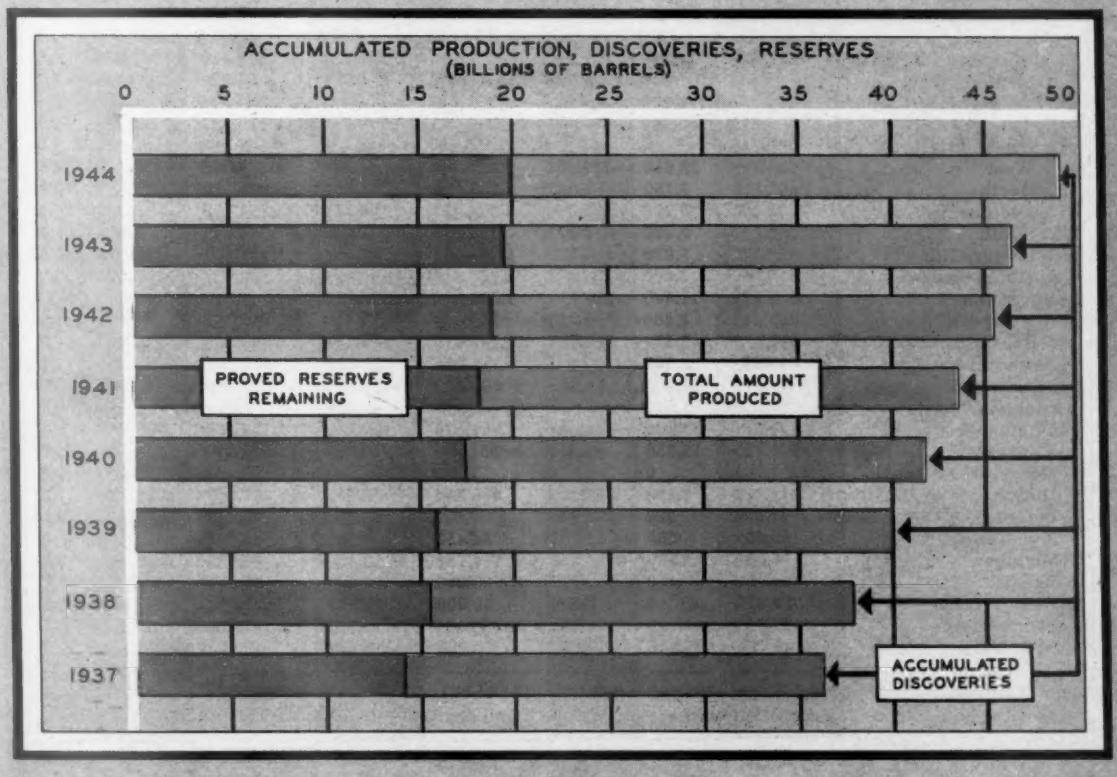
The reason for worry at present is that this ratio also affects the rate at which daily production can be sustained. The constantly expanding demands of war have taken up about all the slack this delicately balanced industry could squeeze out of its operations. From now on the increased production required can be achieved only by increased expenditure of materials and manpower in drilling an increasing number of wells.

In checking the balance sheet of reserves this year, it is obvious that very little new proven oil has been established by fields discovered during 1944. On the other hand, extensions to previously discovered fields and new pays in those fields, plus reappraisals of the recoverable oil in many older fields, have more than balanced the withdrawals. This trend of small proven reserves from newly discovered fields seems likely to continue for the duration of the war.

The reasons for the small amount of reserves

Maps showing locations of new discoveries and data on proven acreage, pay thickness and estimated reserves in new fields start on page 185. Current production and reserves remaining in previously discovered fields are shown in tables starting on page 193.

Chart adapted from PIWC economics committee report on oil-industry trends



RESERVES

from newly discovered fields are many, but the principal ones are the result of war. When a new field is discovered, it is impossible to secure the materials and the manpower for quick development. Development of a field to a substantial size calls for large amounts of materials, the services of many geologists, many drilling rigs, service facilities for the drilling rigs, tanks, pipe lines and living quarters for both the development and operating forces. There are not enough of any of these available to permit plans to be changed rapidly to shift them from their previously budgeted assignments into the new area. For example, the West Edmond field, an April 1943 discovery, extremely favorably located from the standpoint of service facilities, was not at its peak rate of development and drilling until about July 1944. Under these circumstances, the important discoveries of 1944 do not stand out in a table of proven reserves as of January 1, 1945. They will begin to show up in their true perspective about January 1, 1946.

During 1944, two new major regions have been definitely established as areas where potential reserves of great size have been found. These two are the Rocky Mountain area of Western Wyoming and Colorado, and the Mississippi-Alabama area which geologically includes some of eastern Louisiana. In addition, the Anadarko basin of Oklahoma might be considered in this category.

In Texas, with huge reserves already established, the potential reserves as distinguished from the proven reserves, are very promising in both East and West Texas and in the Lower Gulf Coast and South Texas. The same conclusion holds in Southern Louisiana.

In California, the situation as to potential reserves compared to proven reserves is not so clear. It is obvious, however, that among the large backlog of rich pools with which California entered the war several have proved to be capable of sustaining much higher rates of production without harm than formerly was considered possible.

PROVEN OIL RESERVES JANUARY 1, 1945

(In thousands of barrels)

	Estimated reserves as of Jan. 1, 1944	1944 Discoveries	Extensions and revisions	Total	Less 1944 production	Estimated reserves as of Jan. 1, 1945	Gain or loss (—)	Per cent U. S. total
California	2,980,082	11,170	+599,933	3,591,185	311,798	3,279,387	+299,305	16.0
Southern	895,203	80	+263,137	1,158,420	114,318	1,044,102	+148,899	5.1
Coastal	453,340	0	+115,418	568,758	49,928	518,830	+65,490	2.5
Northern	1,631,539	11,090	+221,378	1,864,007	147,552	1,716,455	+84,916	8.4
Montana	103,317	700	—2,662	101,355	8,675	92,680	—10,637	0.5
Wyoming	617,543	16,280	+19,450	653,273	33,463	619,810	+2,267	3.0
Colorado, Utah	30,779	940	+29,234	60,953	3,033	57,920	+27,141	0.3
New Mexico	582,049	6,200	—6,572	581,677	39,751	541,926	—40,123	2.6
Texas	11,346,019	59,690	+856,676	12,262,385	742,158	11,520,227	+174,208	56.2
Panhandle	599,655	0	—44,298	555,357	34,657	520,700	—78,955	2.5
West	2,807,229	23,610	—288,901	3,119,740	161,400	2,958,340	+151,111	14.5
North	645,463	9,750	+1,532	656,745	54,695	602,050	—43,413	2.9
Eastern	3,304,797	6,260	+135,080	3,446,137	184,527	3,261,610	—43,187	15.9
South	353,287	3,320	+32,821	389,428	35,333	354,095	+808	1.7
Lower Gulf	927,122	7,870	+266,569	1,201,561	79,061	1,122,500	+195,378	5.5
Upper Gulf	2,708,466	8,880	+176,071	2,893,417	192,485	2,700,932	—7,534	13.2
Louisiana	1,073,412	11,460	+297,077	1,381,949	135,406	1,246,543	+173,131	6.1
Northern	261,241	1,485	+16,710	279,436	26,256	253,180	—8,061	1.3
Southern	812,171	9,975	+280,367	1,102,513	109,150	993,363	+181,192	4.8
Arkansas	367,301	2,000	—13,417	355,884	29,116	326,768	—40,533	1.6
Mississippi	48,213	54,300	+66,758	169,271	16,505	152,766	+104,553	0.7
Alabama	0	1,550	0	1,550	55	1,495	+1,495	0.0
Oklahoma	1,109,181	14,100	+138,294	1,261,575	123,436	1,138,139	+28,958	5.5
Kansas	905,145	12,350	—66,365	851,130	99,857	751,273	—153,872	3.7
Nebraska-Missouri	1,941	0	0	1,941	460	1,481	—460	0.0
Illinois	415,135	8,650	+14,949	438,734	76,987	361,747	—53,388	1.8
Indiana	31,696	380	—1,454	30,622	5,119	25,503	—6,193	0.1
Ky., Tenn.	45,905	320	+13,228	59,453	9,602	49,851	+3,946	0.2
Michigan	94,768	4,560	+14,866	114,194	18,159	96,035	+1,267	0.5
Ohio	33,203	0	+777	33,980	2,968	31,012	—2,191	0.1
West Virginia	33,970	0	+2,339	36,309	3,309	33,000	—970	0.2
Pennsylvania	181,522	0	—44,961	136,561	15,553	121,008	—60,514	0.6
New York	45,724	0	+25,182	70,906	4,738	66,168	+20,444	0.3
Total U. S.	20,046,905	204,650	1,943,332	22,194,887	1,680,148	20,514,739	+467,834	100.0

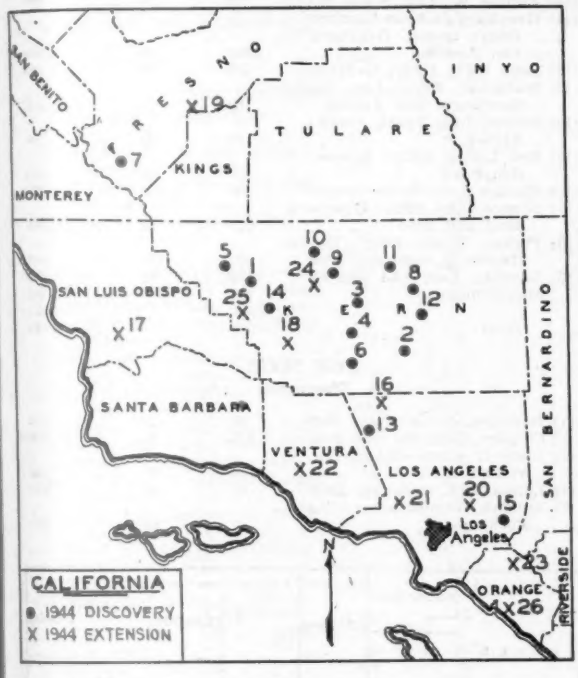
Extensions and revisions total is an increase of 1,943,332,000 bbl.

NEW OIL RESERVES—Their Location and Size

Details on the locations of new discoveries, pay thickness, newly proven acreage and reserves presented in the following 9 pages are supplemented by completion data on each discovery well in a subsequent section of this issue. (See page 210).

The discovery-reserve tables are keyed by numbers to the solid circles (for discoveries) and crosses (for major extensions) on the regional maps. Proven acreage and reserves assigned to newly discovered pools is admittedly on the conservative side and represent status of development at end of the year. Many of the new discoveries, particularly those brought into production during recent weeks, will grow substantially in subsequent months. No attempt has been made to appraise the indicated productive acreage and proven reserves, although it is obvious that most new discoveries will eventually exceed figures which are specifically assignable on the basis of present development.

Supplemental data on discovery wells completed during 1944, includes the operating company, farm name, detailed location by section or survey, depth of pay and initial production.



CALIFORNIA

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Antelope Plains, Kern; Hopkins, Eocene	40	25	200
(2) Ant Hill, Kern; Olcese, Miocene	120	55	750
(3) Bakersfield Sewer Farm, Kern; Wicker, Miocene	20	...	100
(4) Bellevue, Kern; Stevens, Miocene	120	...	1,200
(5) Blackwells Corner, Kern; Santos, lower Miocene	120	125	1,200
(6) Gosford, Kern; Stevens, Miocene	80	100	800
(7) Jacalitos, Northwest, Fresno; Temblor, Miocene	180	35	1,800
(8) Mountain View, North, Kern; Wharton, Miocene	180	70	1,800
(9) Mount Poso, East, Kern; Vedder, Miocene	80	20	240
(10) Mount Poso, Northwest, Kern; Vedder, Miocene	80	50	800
(11) Premier, East, Kern; Etchegoin, Pliocene	160	75	1,600
(12) Race Track, Kern; Jewett, Miocene	120	25	120
(13) San Martinez, West, Los Angeles; Newhall, Pliocene	40	100	40
(14) Sheep Springs, Kern; Carneros, Miocene	120	35	480
(15) Whittier Heights, Los Angeles; Turnbull, Miocene	40	75	40
Total	1,500		11,170

New Pays and Extensions

(16)) Aliso Canyon, Los Angeles; Sesnon, Eocene	40	100	400
(17) Arroyo Grande, San Luis Obispo; Pismo, Pliocene	20	25	10
(18) Buena Vista Hills, Kern; Zone 27-B, Pliocene	1,600	150	40,000
(19) Lanare, Fresno; Helm, Eocene	160	40	400
(20) Montebello Extension, Los Angeles; H & S sand, Miocene	20	25	200
(21) Potrero, Los Angeles; Potrero, Miocene	10	50	10
(22) San Miguelito, Ventura; Grubb, Pliocene	320	400	25,000
(23) Buena Park, Orange; Buena Park, Miocene	40	...	200
(24) Cymric, Kern; Cymric Tar Sand, Pleistocene	640	30	500
(25) Elk Hills, Kern; first and second Scales sands, Pliocene	1,000	...	25,000
(26) Seal Beach, Orange; McGrath, Miocene	320	...	7,500
Total	4,170		99,220

COLORADO

Discoveries

(1) Clark's Lake, Larimer; Muddy	200	63	700
(2) North Fort Collins, Larimer; Muddy	40	25	240
Total	240		940

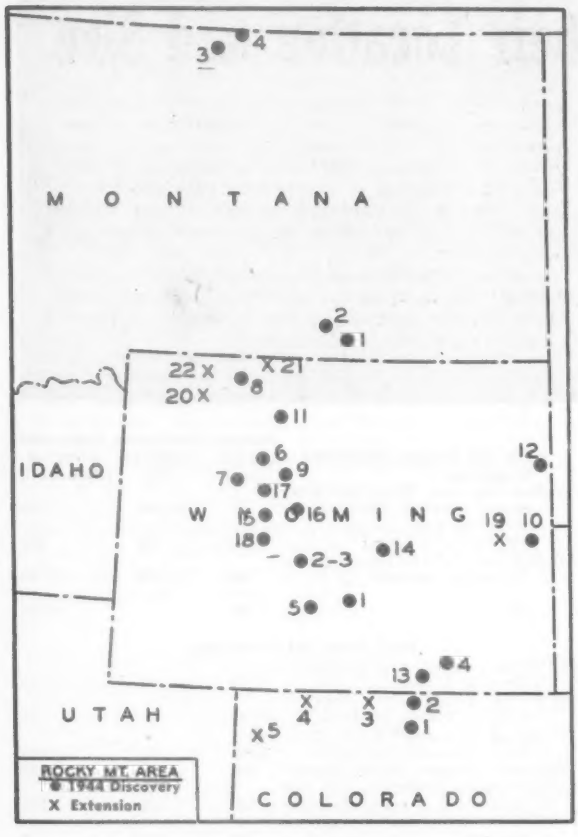
Extensions

(3) North McCallum, Jackson; Dakota	800	90	2,500
(4) Powder Wash, Moffat; Wasatch	160	25	940
(5) Rangely, Rio Blanco; Weber	960	250	14,400
Total	1,920		17,840

WYOMING

Discoveries

(1) Bailey, Carbon; Sundance	40	50	600
(2) Big Sand Draw, Fremont; Embar	40	35	400
(3) Big Sand Draw, Fremont; Tensleep	40	250	600
(4) Cooper Grove, Carbon; Dakota	100	35	800
(5) Crook's Gap, Fremont; Lakota	40	50	300
(6) Gebo, Hot Springs; Tensleep	160	200	2,500
(7) Golden Eagle, Hot Springs; Muddy	40	40	400



WYOMING (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(8) Half Moon, Park; Embar	40	90	200
(9) Kirby Creek, Hot Springs; Embar	40	75	200
(10) Little Buck Creek, Niobrara	80	40	360
(11) Little Buffalo Basin, Park; Tensleep	600	250	6,000
(12) Mush Creek, Weston; Muddy	40	30	120
(13) North Big Hollow, Albany; Muddy	80	20	260
(14) Spindletop, Natrona; Tensleep	40	200	400
(15) Steamboat Butte, Fremont; Tensleep	40	250	600
(16) Steamboat Butte, Fremont; Lakota	40	30	240
(17) Wagonhound, Hot Springs; Embar	40	80	300
(18) Winkleman, Fremont; Tensleep	200	300	2,000
Total	1,600		16,280
Extensions			
(19) East Lance Creek, Niobrara; Dakota	80	40	400
(20) Fourbear, Park; Tensleep	80	185	400
(21) Garland, Park-Big Horn; Tensleep	2,000	130	20,000
(22) Pitchfork, Park; Tensleep	40	60	400
Total	2,200		21,200

MONTANA

Discoveries

(1) Clark's Fork, Carbon; second Frontier	40	75	200
(2) Dry Creek, Carbon; Morrison	40	40	400
(3) Farmington, Teton; Ellis-Madison	10	5	20
(4) Willshaw block, Toole; Sunburst	40	28	80
Total	130		700

SOUTHEAST NEW MEXICO

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Drinkard, Lea; Clear Fork	40	85	320
(2) Dublin, Lea; Ellenburger	40	58	600
(3) Tonto, Lea; Permian	40	21	160
(4) New field, unnamed, Eddy; Yates	40	165	40
(5) New field, unnamed, Eddy; Permian	40	80	40
(6) New field, unnamed, Lea; Wolfcamp	40	25	240
(7) Turner area, South Lovington, Lea; San Andres	640	370	4,800
Total	880		6,200
Extensions			
(8) Arrowhead, Lea; Grayburg	320	80	1,000
(9) Caprock, Lea, Chaves; Seven Rivers	320	25	640
(10) Eunice, W., Lea; Seven Rivers	120	30	400
(11) Grayburg-Jackson-Leonard, Eddy; Queen, Grayburg, San Andres	1,300	50	4,000
(12) Loco Hills, Eddy; Grayburg	320	90	1,280
(13) Maljamar, Eddy, Lea; Queen Grayburg, San Andres	500	75	1,500
(14) Mattix, Lea; Yates, Seven Rivers	120	45	400
(15) Red Lakes, Eddy; Queen, Grayburg	320	40	640
(16) Rhodes, Lea; Seven Rivers	360	60	1,200
(17) Square Lake, Eddy; Grayburg, sand and lime	320	30	3,500
(18) Turkey Track, Eddy; Queen, Grayburg, sand and lime	200	100	300
(19) Vacuum, Lea; San Andres	400	75	1,000
Miscellaneous	300		1,200
Total	4,900		17,060

WEST TEXAS

Discoveries

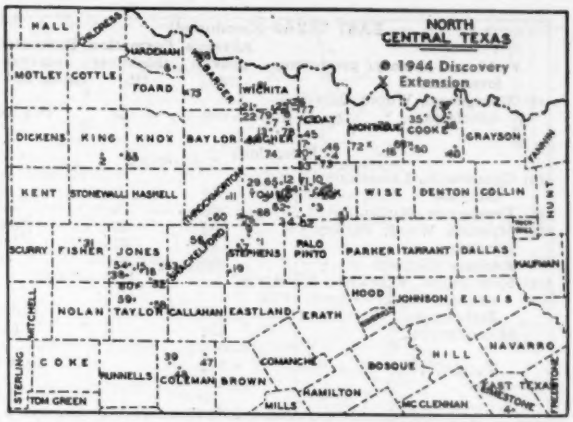
(1) Barnsley, Crane; Clear Fork	40	150	160
(2) Chipley, Cochran; San Andres	240	15	720
(3) Crossett, Crane-Upton; Devonian	120	60	480
(4) Emma Holt, Andrews; Holt	40	20	160
(5) Eubank, Gaines; lower Clear Fork	40	50	200

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(6) Fort Stockton, Pecos; Yates	240	50	750
(7) Lion, Ward; Delaware	40	15	120
(8) Mabee, Andrews; Grayburg	3,000	60	12,000
(9) Midland Farms, Andrews; San Andres	320	100	1,500
(10) North Monahans, Winkler; Clear Fork (Tubb)	320	100	1,600
(11) Morita, Howard; San Andres	2,500	80	3,000
(12) Patillos, Andrews; Grayburg-San Andres	80	110	120
(13) P-H-D, Garza; San Andres	40	21	60
(14) Smyer, Hockley; Clear Fork	240	86	400
(15) Whiteface, Cochran; San Andres	300	50	1,000
(16) Yellowhouse, Hockley; San Andres	120	60	400
(17) Unnamed, Andrews; San Andres	40	95	60
(18) Unnamed, Cochran; San Andres	40	20	120
(19) Unnamed, Ector; Devonian	40	34	500
(20) Unnamed, Pecos; Seven Rivers	120	55	240
(21) Unnamed, Reagan; Grayburg	40	40	80
Total	7,960		23,610
New Pays and Extensions			
(22) Barnhart, Reagan; Ellenburger	800	100	8,000
(23) Cowden, North, Ector; San Andres	1,800	110	9,000
(24) Embar-Ellenburger, Andrews; Ellenburger	160	55	1,600
(25) Fullerton, Andrews; Yates	20	150	25
Devonian	80	140	800
Wichita	9,000	300	100,000
(26) Mascho-Fuhrman, Andrews	1,400	100	6,000
(27) Goldsmith, Ector; San Andres	480	50	3,480
(28) Halley, Winkler; Whitehorse	520	90	2,000
(29) Kermit-Ellenburger, Winkler; Ellenburger	240	45	1,000
(30) Keystone-Ellenburger, Winkler; Ellenburger	640	300	12,000
(31) Keystone-Holt, Winkler; Clear Fork	800	50	4,000
(32) Means, Andrews; San Andres	1,000	125	5,000
(33) Monahans, Ward; Ellenburger	160	110	2,500
(34) Ownby, Yoakum; San Andres	500	150	2,000
(35) Sand Hills, Crane; Ellenburger	120	110	1,800
McKnight	240	86	2,400
Sand Hills, Ordovician, Crane; Ellenburger	120	80	1,800
Sand Hills, Permian, Crane; Wichita	440	150	4,000
(36) Seminole, Gaines; San Andres	680	60	2,500
(37) Slaughter, Cochran-Hockley-Terry; San Andres	4,300	75	25,800
(38) Todd Deep, Crockett; Ellenburger	80	60	1,200
Strawn, Crinoidal	160	90	3,000
(39) Union, Andrews; Wichita	600	200	5,000
(40) Vincent, Howard; lower Clear Fork	40	51	60
(41) Waddell, Crane; San Andres	440	75	4,000
(42) Ward, North, Ward-Winkler; Whitehorse	1,400	80	4,500
(43) Wasson, Gaines-Yoakum; Whitehorse	1,200	75	5,000
Wasson 6300, Gaines; Clear Fork	560	450	5,000
Wasson "72," Gaines; Clear Fork	560	300	4,000
(44) Westbrook, Mitchell; Clear Fork	1,200	100	3,000
(45) Wheeler, Winkler; Ellenburger	360	240	6,000
Total	30,100		236,465

NORTH AND WEST CENTRAL TEXAS

Discoveries

(1) Atkins, Stephens; Mississippian	40	45	200
(2) Buffalo Springs, Clay; Simpson (Ordovician)	40	20	80
(3) Chillicothe, Hardeman; Strawn	40	7	40
(4) Ewalt, Throckmorton; Bend	40	6	240
(5) Farmer, Young; Bend	40	20	240
(6) Garrett, Archer; Strawn	100	18	500
(7) Gatewood, Cooke; Strawn	40	12	100



Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(8) Hundley, Montague; Bend conglomerate	80	7	500
(9) Lester, Jack; Mississippian	120	40	600
(10) Madden, Wichita; Strawn	100	21	200
(11) Madden, Wichita; Bend	40	20	200
(12) McNutt, Montague; Viola	40	15	120
(13) Odell, Wilbarger; Palo Pinto	120	50	600
(14) Ross, W., Clay; Bend	40	40	240
(15) Scaling, Clay; Bend	80	16	240
(16) Sivels Bend, Cooke; Strawn	40	20	100
(17) Weaver, Jones; Cook	20	4	40
(18) Williams, Coleman; Gray	320	30	2,000
(19) Woodbine, Cooke; Strawn	300	8	1,000
(20) Unnamed, Archer; Cisco	10	9	10
(21) Unnamed, Archer; Gunsight	10	5	10
(22) Unnamed, Archer; Cisco	20	4	40
(23) Unnamed, Archer; Cisco	10	8	15
(24) Unnamed, Clay; Strawn	80	25	400
(25) Unnamed, Clay; Bend	40	10	80
(26) Unnamed, Coleman; Ranger	20	12	20
(27) Unnamed, Coleman; Strawn	20	25	30
(28) Unnamed, Cooke; Bend conglomerate	40	9	75
(29) Unnamed, Cooke; Strawn	20	8	40
(30) Unnamed, Jack; Bend	40	40	120
(31) Unnamed, Jack; Strawn	20	8	30
(32) Unnamed, Jones; Bluff Creek	80	12	200
(33) Unnamed, Jones; Gunsight	20	22	30
(34) Unnamed, King; Strawn	40	24	200
(35) Unnamed, Shackelford; Fry	10	4	10
(36) Unnamed, Stephens; Bend	40	10	80
(37) Unnamed, Taylor; Flippen	20	19	30
(38) Unnamed, Taylor; Flippen	20	16	40
(39) Unnamed, Throckmorton; Cisco	20	8	50
(40) Unnamed, Wichita; Cisco	20	3	40
(41) Unnamed, Young; Bend	40	50	160
(42) Unnamed, Young; Marble Falls	40	17	200
(43) Unnamed, Young; Mississippian	40	70	240
(44) Unnamed, Young; Bend	40	25	240
(45) Unnamed, Young; Bend	40	16	40
(46) Unnamed, Young; Marble Falls	40	5	40
(47) Unnamed, Young; Strawn	40	5	40
Total	2,520		9,710

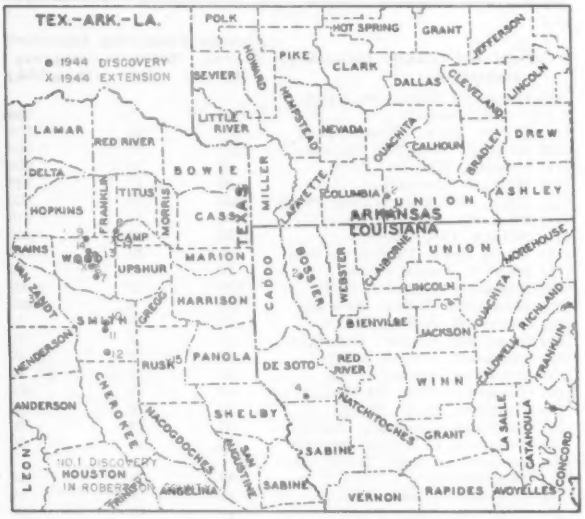
EAST TEXAS

Discoveries

(1) Calvert, Robertson; basal Navarro	20	12	40
(2) Eylau, Bowie; Smackover	40	8	100
(3) Fruitvale, Van Zandt; Travis Peak	100	25	300
(4) Merigale, Wood; Sub-Clarksville	40	45	40
(5) Pickton, Hopkins; Bacon (Rodessa)	40	8	100
(6) Sand Flat, Smith; Paluxy, Rodessa	400	40-14	1,200
(7) South Tyler, Smith; Rodessa	80	80	280
(8) Winnsboro, Wood; Bacon (Rodessa)	600	24	2,100

EAST TEXAS (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(9) Winnsboro, Wood; Gloyd (Rodessa)	600	30	2,100
Extensions			
(10) Groesbeck, Limestone; Rodessa	40	5	40
(11) Henderson, Rusk; Pettit	200	14	400
(12) Manziel, Wood: Paluxy	500	20	2,000
Pittsburg	40	20	100
Rodessa (Young)	40	50	40
(13) New Hope, Franklin; Elledge (Travis Peak), Bacon, Hill, Pittsburgh	1,500	90	15,000
Miscellaneous	100	...	1,060
Total	4,340		24,900



ARKANSAS
Discoveries

(1) Calhoun, Columbia; Smackover	240	20	1,200
(2) Salem Church, Union; Smackover	80	20	400
(3) Wilks, Union; Smackover	80	15	400
Total	400		2,000

NORTH LOUISIANA
Discoveries

(1) Bear Creek, Bienville; Pettit	40	20	50
(2) Benton, Bossier; Cotton Valley "D"	160	40	400
(3) Delhi, Richland; Tuscaloosa	40	10	200
(4) Mansfield, De Soto; Eagleford	10	10	35
(5) Sicily Island, Catahoula; Tuscaloosa	160	40	400
(6) Tremont, Lincoln; Cotton Valley	160	25	400
Total	570		1,485

WESTERN KENTUCKY
Discoveries

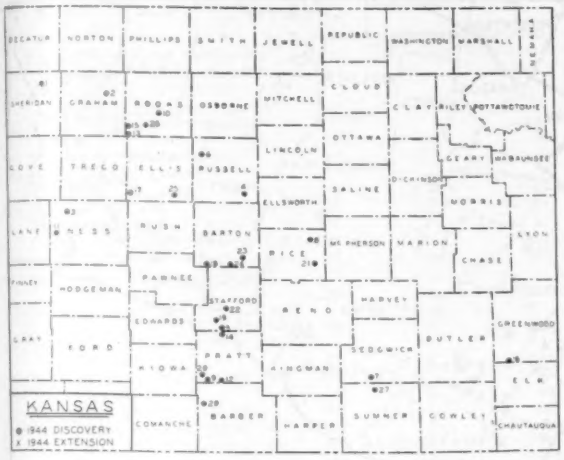
Powell's Lake, Union; Waltersburg	70	8	210
Utley, North, Union; Levias	10	3	10
East Clay, Webster; Pennsylvanian	30	22	30
Unnamed, Hopkins; Pennsylvanian	10	10	10
Grassy Pond, Henderson; Aux Vases	10	18	10
Sturgis, Union; Hardinsburg	10	12	10
Curdsville, Daviess; Cypress	10	12	10
Raphael, Daviess; Aux Vases	10	12	10
McKinley, Henderson; Tar Springs	10	13	10
Rock Springs, Henderson; Cypress	10	4	10
Total	180		320

ILLINOIS
Discoveries

(1) Bennington, S. Edwards; McClosky	80	6	120
(2) Bogota, S., Jasper; McClosky	80	5	80
(3) Boyd, Jefferson; Bethel	800	14	2,200
(4) Calhoun, Richland; Levias	350	7	630
(5) Divide, W., Jefferson; McClosky	600	12	1,000
(6) Hoodville, E., Hamilton; McClosky	80	5	80
(7) Keensburg, S., Wabash; Levias	80	7	120
(8) Maple Grove, E., Edwards; McClosky	200	10	250
(9) Mount Erie, N., Wayne; Aux Vases	240	10	300
(10) New Haven, N., White; Tar Springs	80	9	80
(11) New Haven, W., Gallatin; Tar Springs	400	16	1,000
(12) Roaches, N., Jefferson; Rosiclaire	1,400	10	2,100
(13) Sailor Springs, E., Clay; Cypress	440	10	440
(14) Sumner, Lawrence; McClosky	40	6	50
(15) Thackeray, Hamilton; Aux Vases	160	10	200
Total	5,040		8,650

INDIANA
Discoveries

Decker, Knox; McClosky	20	8	20
New Harmony, South, Posey; Hardinsburg	100	19	200
South Owensville, Gibson; McClosky	20	5	10
Upton, Posey; Tar Springs	60	6	70
Unnamed pool, Jay; Trenton	20	20	20
Unnamed pool, Pike; Cypress	20	4	40
Unnamed pool, Posey; McClosky	20	12	20
Total	260		380



KANSAS

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Adell, Sheridan; Lansing	200	6	250
(2) Alda, Graham; Lansing-Kansas City	80	5	120
(3) Arnold, Ness; Mississippi lime	120	10	180
(4) Beisel, Russell; Arbuckle	40	4	50
(5) Cadman, Stafford; Viola	40	3	50
(6) Claussen, Russell; Lansing	40	3	30
(7) Clearwater, Sedgwick, Lansing	80	5	175
(8) Click, Rice; Misener	40	4	50
(9) Coates, Pratt; Simpson	120	4	500
(10) Hobart, Rooks; Lansing	120	10	275
(11) Kansada, Ness; Mississippi	40	8	75
(12) Ludwick, Pratt; Simpson	80	8	240
(13) Marcotte, Rooks; Arbuckle	320	5	1,200
(14) McCandless, Stafford; Simpson	200	6	750
(15) Palco, Rooks; Arbuckle	160	8	600
(16) Petterson, Greenwood; Arbuckle	40	1	40
(17) Pleasant, Ellis; Reagan	120	6	360
(18) Pritchard, Barton; Arbuckle	280	6	1,000
(19) Richland, Stafford; Arbuckle	160	5	400
(20) Shriver, Pratt; Simpson	80	5	250
(21) Smyres, North, Rick; Mississippi	40	6	50
(22) St. John's townsite, Stafford; Arbuckle	360	5	1,250
(23) St. Peter, Barton; Arbuckle	80	8	175
(24) Workman, Barton; Arbuckle	40	5	60
(25) Younger, Ellis; Arbuckle	40	5	60
(26) Zurich townsite, Rooks; Arbuckle	80	6	200
(27) Zyba, Southwest, Sumner; Simpson	40	5	60
(28) Skinner, Barber; Viola	1,300	20	3,900
Total	4,340		12,350

OKLAHOMA

Discoveries

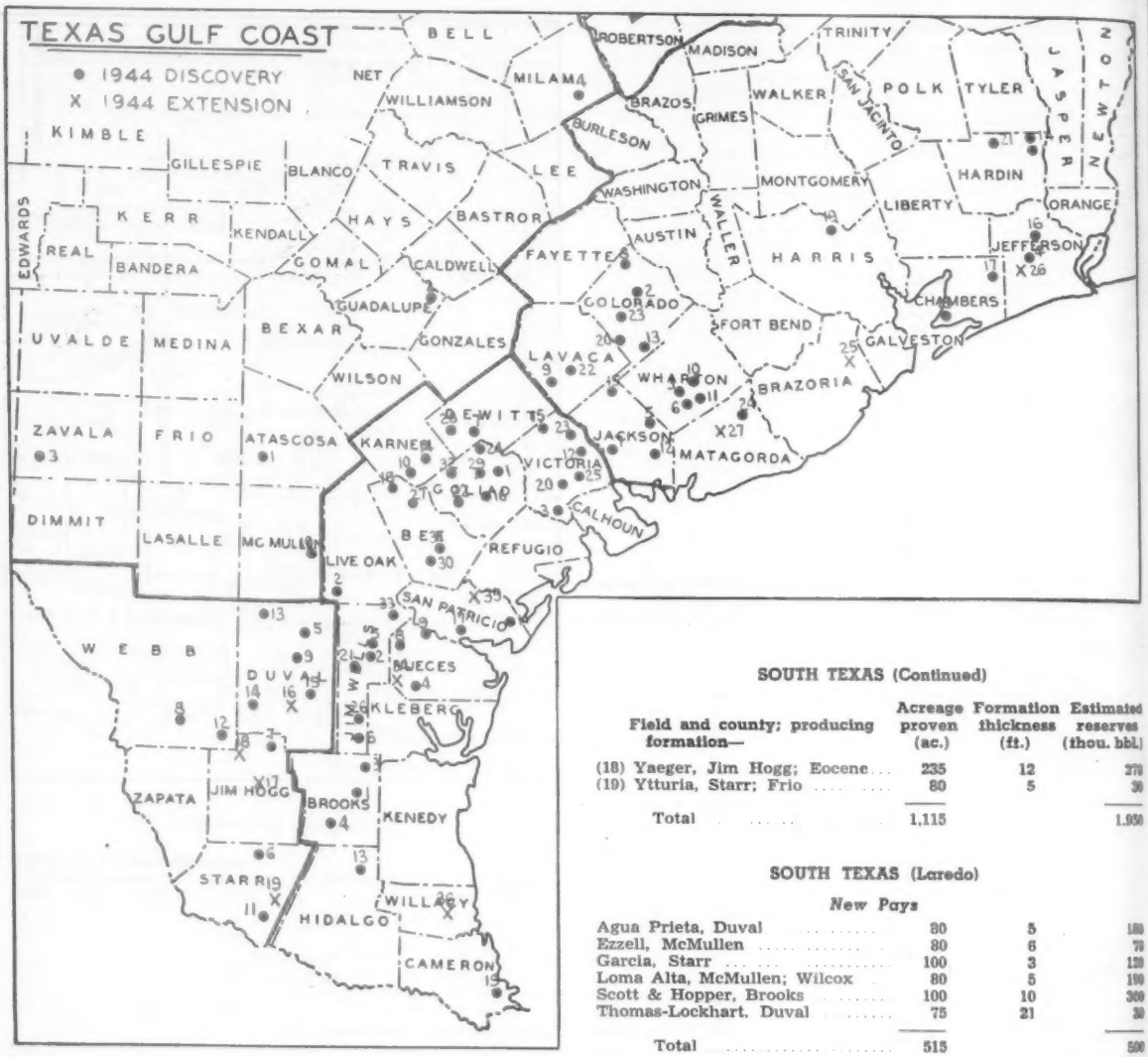
Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Arcadia, Northeast, Oklahoma; Wilcox	40	20	1,800
(2) Autwine, Kay; Mississippi chat	20	10	50
(3) Centerpoint, South, Pottawatomie; Earlsboro	40	20	80
(4) Cheyarha, Seminole; Booch	200	25	400
(5) Crescent, East, Logan; Layton	120	25	480
(6) Crescent, Northeast, Logan; second Wilcox	40	10	120
(7) Hickory Grove, Creek; Prue	40	20	160

OKLAHOMA (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(8) Hoover, Northwest, Garvin; Pontotoc	240	60	960
(9) Horn's Corner, North, Hughes; Cromwell	240	10	1,200
(10) Ingalls, Northwest, Payne; second Wilcox	100	10	300
(11) Lone Grove, Southwest, Carter; Pennsylvanian	160	40	800
(12) Moore, South, Cleveland; second Wilcox	140	20	560
Bartlesville	300	20	1,000
(13) Moore, West, Cleveland; second Wilcox	300	30	1,750
(14) Moral, Northeast, Pottawatomie; Hunton	80	20	320
(15) Noble, West, McClain; Bromide	160	35	1,000
(16) Padin, North, Okfuskee; Dutcher	40	30	140
(17) Pettiquah, Okfuskee; Red Fork	200	12	250
(18) Sumner, West, Noble; second Wilcox	80	20	400
(19))Washington, McClain; second Wilcox	160	20	1,000
(20) Unnamed, Logan; Layton	40	15	50
(21) Unnamed, Lincoln; Cleveland	60	18	240
(22) Unnamed, Garvin; Bromide	30	17	100
(23) Unnamed, Hughes; Cromwell	20	10	100
(24) Unnamed, Hughes; Gilcrease	20	15	40
(25) Unnamed, Hughes; Booch	80	15	200
(26) Unnamed, Logan; Layton	160	25	500
(27) Unnamed, Okfuskee; Hunton	40	15	60
(28) Unnamed, Pontotoc; second Cromwell	20	15	30
(29) Unnamed, Hughes; Booch	10	15	10
Total	3,180		14,100

Extensions

(30) W. Edmond, Oklahoma; Bois d'Arc-Hunton	29,000	65	165,000



SOUTH TEXAS

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Boedeker, Brooks	320	10	Gas
(2) Chapa Ranch, Live Oak; Wilcox	100	35	300
(3) Dan Sullivan, Brooks	80	9	320
(4) East Alta Mesa, Brooks	160	23	300
(5) Herbst, Duval	40	5	40
(6) Jakalak, Starr; Oligocene	100	22	Gas
(7) Las Mujeres; Jim Hogg; Pettus	40	10	50
(8) Retamia, Webb; Carrizo-Wilcox	100	25	80
(9) Rosita (Reyes), Duval; Pettus	140	5	270
(10) San Caja, McMullen; Carrizo-Wilcox	100	26	450
(11) Solis, Starr	100	8	Gas
(12) South Bruni, Webb	160	2	Gas
(13) South Eagle Hill, Duval; Government Wells	40	9	100
(14) Unnamed, Duval; Jackson	60	9	10
(15) Unnamed, Duval	100	11	Gas
Total	1,700		1,920

Extensions

(16) Southland, Duval; Pettus	400	5	750
(17) Well, Jim Hogg	400	10	900

SOUTH TEXAS (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(18) Yaeger, Jim Hogg; Eocene	235	12	270
(19) Ytturia, Starr; Frio	80	5	30
Total	1,115		1,950

SOUTH TEXAS (Laredo)

New Pays

Agua Prieta, Duval	80	5	180
Ezzell, McMullen	80	6	70
Garcia, Starr	100	3	120
Loma Alta, McMullen; Wilcox	80	5	190
Scott & Hopper, Brooks	100	10	300
Thomas-Lockhart, Duval	75	21	30
Total	515		890

SOUTH CENTRAL TEXAS

Discoveries

(1) Charlotte, Atascosa; Edwards	80	18	970
(2) United, Guadalupe; Del Rio	80	10	330
(3) Van Cleve, Zavalla; Navarro	80	6	Gas
(4) Unnamed, Milam	40	17	75
Total	280		1,400

LOWER GULF COAST, TEXAS

Discoveries

(1) Albrecht, Goliad; Wilcox	100	20	230
(2) Almond, Jim Wells	160	5	Gas
(3) Anaqua, Victoria	160	8	Gas
(4) Brayton, Nueces; Frio	385	56	1,200
(5) Brownlee, Jim Wells; Vicksburg	40	10	100
(6) Canales, Jim Wells; Frio-Vicksburg	250	5	920
(7) Cottonwood Creek, DeWitt; Wilcox	160	10	Gas
(8) Dougherty, Nueces; Vicksburg	40	5	30
(9) East Riverside, Nueces	80	5	210
(10) Green, Karnes	40	10	60
(11) Gregory, San Patricio; Frio	100	20	720
(12) Koontz, Victoria	100	6	260
(13) Los Indios, Hidalgo	160	5	Gas
(14) McCaskill, Karnes	160	5	80
(15) Mission Valley, Victoria; Wilcox	160	5	100

LOWER GULF COAST, TEXAS (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(16) North Goliad (Fromme) Goliad; Vicksburg	160	10	Gas
(17) North Odem, San Patricio; Frio	40	6	50
(18) Plummer-Wilcox; Bee	40	4	50
(19) Point Isabel, Cameron; Miocene	160	3	Gas
(20) Pridham's Lake, Victoria	40	4	100
(21) Ray-Wilcox, Bee; Carrizo	160	3	40
(22) Seiler, Jim Wells; Frio	160	12	Gas
(23) South Cabeza Creek, Goliad	40	10	120
(24) South Inez (North Keeran), Victoria	160	6	Gas
(25) South Weesatche; Goliad; Wilcox	80	10	40
(26) Southeast Telferner, Victoria; Oligocene	80	4	40
(27) Tijerina, Jim Wells; Frio	450	10	3,350
(28) Toro Creek; Bee	80	8	40
(29) Warmley, DeWitt; Wilcox	160	5	40
(30) Weesatche, Goliad; Wilcox	80	5	40
(31) Yougeen, Bee; Vicksburg	160	10	Gas
(32) Unnamed, Bee	160	10	Gas
(33) Unnamed, Goliad	160	10	Gas
(34) Unnamed, Jim Wells; Miocene	160	12	Gas
Total	4,625		7,870

Extensions

(35) Agua Dulce, Nueces; Frio	500	5	2,220
(36) Plymouth, San Patricio; Frio	200	5	250
(37) Willamar, Willacy; Margulina	880	12	4,000
Total	1,580		6,470

New Pays

Agua Dulce, Nueces; Pfleuger	80	12	480
Burnell-Wilcox, Bee	160	10	Gas
McFaddin, Victoria	100	5	160
North Luby, Nueces	80	5	180
Saxet, Nueces	160	13	Gas

UPPER GULF COAST, TEXAS

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Beech Creek, Hardin	120	8	600
(2) Columbus, Colorado; Wilcox	160	17	240
(3) Daboval, Wharton	90	5	60
(4) East Fannett, Jefferson; Frio	80	12	240
(5) East Mauritz, Jackson; Frio	150	6	350
(6) El Campo, Wharton	360	5	830
(7) El Toro, Jackson; Frio	160	10	Gas
(8) Frelsburg, Colorado; Wilcox	160	15	220
(9) Hope, Lavaca	160	34	430
(10) Hungerford, Wharton	160	5	Gas
(11) Lane City, Wharton	80	5	200
(12) La Salle, Jackson; Marginulina-Frio	100	6	170
(13) Nada, Colorado; Cockfield	450	8	300
(14) North Beech Creek, Hardin; Cockfield	80	10	160
(15) North Cordele, Jackson	160	10	Gas
(16) North Lovell Lake, Jefferson	100	5	270
(17) North Winnie, Chambers	360	5	1,250
(18) Smith Point, Chambers	300	11	2,100
(19) Spring, Harris; Cockfield	80	5	280
(20) Sublime, Colorado	80	5	200
(21) Village Mills, Hardin	200	14	Gas
(22) Word, Lavaca	80	4	200
(23) Unnamed, Colorado	90	29	650
(24) Unnamed, Matagorda	160	8	130
Total	3,920		8,880

Extensions

(25) Chocolate Bayou, Brazoria	480	5	950
(27) North Bay City, Matagorda	160	8	270
Total	640		1,220

New Pays

Blue Ridge, Fort Bend	40	5	40
Danbury, Brazoria	80	10	50
Fannett, Jefferson	80	10	450
Fannett, Jefferson	300	20	3,750
Harmon, Jackson	100	5	170

UPPER GULF COAST, TEXAS (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
Hull, Liberty	80	60	2,800
Humble, Harris	80	8	500
Humble, Harris	80	15	720
Humble, Harris	80	30	720
Joyce Richardson, Harris	100	5	150
Livingston, Polk	100	10	750
Needville, Fort Bend	100	9	400
Needville, Fort Bend	160	14	Gas
North La Ward, Jackson	100	5	100
Sour Lake, Hardin	80	10	150
West Ganado, Jackson	120	15	480
Total	1,680		11,230

MICHIGAN

Discoveries

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
Barry, Barry; Traverse	20	5	20
Bloomer, Montcalm; Traverse	100	8	200
Coldwater, Isabella; Dundee	240	10	480
Dalton, Muskegon; Traverse	160	8	320
Deep River, Arenac; Dundee	340	15	3,000
Dorr, North, Allegan; Traverse	20	8	10
Enterprise, Missaukee; Richfield	20	5	10
Fork, South, Mecosta; Dundee	20	5	30
Hopkins, Allegan; Traverse	20	5	40
Home, Montcalm; Dundee	100	10	150
Monterey, South, Allegan; Traverse	120	5	180
Pinconning, Bay; Dundee	20	15	100
Sherman, North, Isabella; Traverse	20	10	20
Total	1,200		4,560

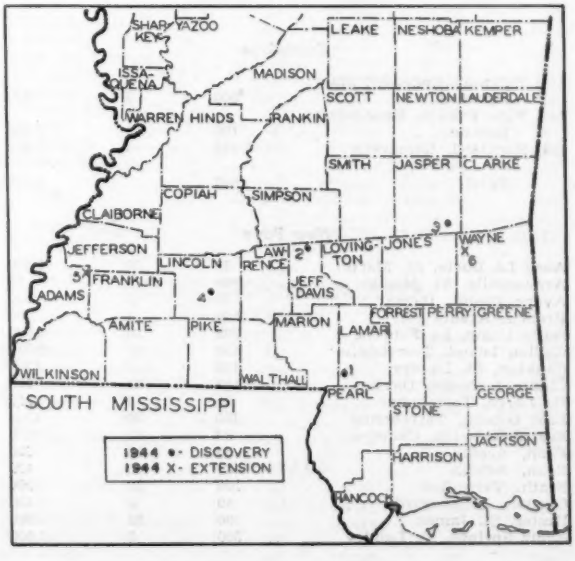
MISSISSIPPI

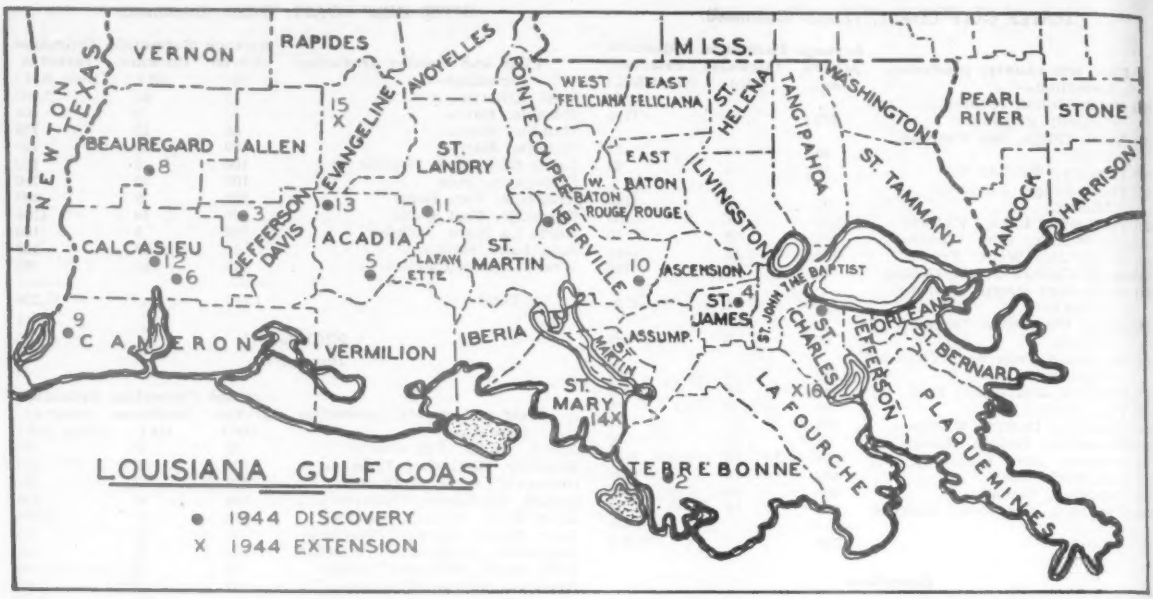
Discoveries

(1) Baxterville, Lamar; Massive	40	60-150	500
(2) Gwinville, Jeff Davis; Tuscaloosa	120	80	3,000
(3) Heidelberg, Jasper; Eutaw	3,500	200	50,000
(4) Mallalieu, Lincoln; Tuscaloosa	40	40	800
Total	3,700		54,300

Extensions

(5) Cranfield, Adams; lower Wilcox	1,360	50	24,000
(6) Eucutta, Wayne, Eutaw	1,400	60	18,000
Total	2,760		42,000





SOUTH LOUISIANA

Discoveries

Field and parish; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Bayou des Glaise, Iberville; Miocene	80	15	600
(2) Bayou Penchant, Terrebonne; Miocene	100	10	50
(3) Bayou Serpent, Jefferson Davis; Ortego	100	10	450
(4) College Point, St. Jomes	160	26	225
(5) Crowley, Acadia	100	5	30
(6) East Moss Lake, Calcasieu; Marginulina-Hackberry	100	10	75
(7) Good Hope, St. Charles	120	8	720
(8) Gordon, Beauregard; basal Frio	200	5	80
(9) Gum Cove, Cameron	320	8	250
(10) Laurel Ridge, Iberville	300	10	250
(11) North Cankton, St. Landry; Hackberry	300	25	4,500
(12) South Lake Charles, Calcasieu	160	8	120
(13) West Tepetate, Jefferson Davis; Ortego	200	15	2,625
Total	2,240		9,975

Extensions

(14) Bateman Lake, St. Mary; Miocene	500	5	350
(15) Pine Prairie, Evangeline; Eocene	100	21	1,250
(16) Raceland, Lafourche	240	8	1,500
Total	840	...	3,100

New Pays

Anse La Burte, St. Martin	80	30	1,200
Arnaudville, St. Martin	160	5	75
Avery Island, Iberia	80	15	600
Branch, Acadia	160	5	100
Bully Camp, La Fourche	200	20	2,000
Caillou Island, Terrebonne	150	40	3,250
Cankton, St. Landry	160	7	Gas
China, Jefferson Davis	160	11	200
De Large, Terrebonne	80	5	550
East Gibson, Terrebonne	160	20	Gas
East Hackberry, Cameron	80	12	670
Egan, Acadia	80	10	620
Egan, Acadia	80	28	400
Erath, Vermilion	100	10	360
Gordon, Beauregard	40	5	120
Hester, St. James	80	20	500
Krotz Springs, St. Landry	500	5	1,500

SOUTH LOUISIANA (Continued)

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
Leeville, LaFourche	100	20	650
Lockport, Calcasieu	80	25	500
North Elton, Allen	250	5	130
North Tepetate, Acadia	100	5	375
Pine Prairie, Evangeline; Wilcox	100	20	1,000
Pine Prairie, Evangeline; Sparta	80	62	2,000
Potash, Plaquemines	60	20	220
Potash, Plaquemines	40	18	250
Rosedale, Iberville	80	4	170
South Roanoke, Jefferson Davis	320	10	300
Starks, Calcasieu	100	10	100
Vacherie, St. James	160	10	120
Venice, Plaquemines	100	18	910
West Bay, Plaquemines	100	10	1,000
West Gueydan, Vermilion	80	4	370
West White Lake, Vermilion	80	5	320
Total	4,180		20,560

ALABAMA

Discoveries

Field and parish; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
(1) Gilbertown, Choctaw; Selma	320	25	1,500
(2) Melvin, Choctaw; Eutaw	20	10	50
Total	340		1,550

OHIO

Extensions

Field and county; producing formation—	Acreage proven (ac.)	Formation thickness (ft.)	Estimated reserves (thou. bbl.)
Ashland, Lorain; Berea and Clinton	410	18	190
Brush Creek-Zanesville, Muskingum, Medina	300	10	200
Clayton, Perry; Clinton	450	40	420
Lancaster, Fairfield; Berea and Clinton	400	28	260
Mount Vernon-Newark, Coshocton; Berea and Clinton	370	18	240
Miscellaneous*	....	...	210
Total	1,930		1,520

*Includes Cambridge and Stewart.

Annual and Cumulative Production, Remaining Reserves by Fields

Remaining reserves in the country's larger fields, detailed on this and the next 10 pages, have added significance this year because it is upon these reservoirs that the nation must depend for sustained record production

PRODUCTION AND RESERVES—CALIFORNIA FIELDS

(In thousands of barrels)

SAN JOAQUIN VALLEY

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Antelope Hills	688	1,541	8,459	27
Antelope Plains	6	6	194	1
Ant Hill	18	18	1,732	3
Arvin	15	1,597	902	2
Bakersfield Sewer Farm	0	.....	100	0
Bellevue	166	166	1,034	3
Belridge, North	2,347	49,473	20,527	77
Belridge, South	4,003	30,531	41,469	693
Blackwells Corner	64	64	1,136	16
Buena Vista Hills	6,897	299,615	85,385	889
Burrel	7	13	237	2
Canal	1,299	10,399	19,601	39
Canfield Ranch	14	131	69	1
Coalinga, East	8,011	242,253	77,747	684
Coalinga, Nose	24,718	77,161	302,839	218
Coalinga, West	2,675	153,344	26,656	762
Coles Levee, North	5,766	12,180	80,461	72
Coles Levee, South	925	14,698	30,161	29
Dyer Creek	.....	28	73	0
Edison	1,041	11,499	8,501	135
Elk Hills	7,719	175,251	234,749	340
Fruitvale	3,055	32,662	22,339	198
Gosford	16	16	784	2
Greeley	5,219	19,083	45,916	90
Helm	476	725	4,775	24
Jacalitos	230	408	2,242	16
Kern Front	4,936	59,810	41,790	715
Kern River	3,508	290,732	24,268	2,025
Kettleman Middle Dome	.....	544	.....	.....
Kettleman North Dome	15,128	295,697	134,803	295
Lanare	53	68	407	3
Lost Hills	1,274	56,543	13,457	373
McClung	48	67	383	2
McKittrick	1,813	97,941	17,559	321
Midway-Sunset	15,179	675,976	134,024	2,681
Mountain View	1,153	44,117	12,683	169
Mount Poso	8,016	79,374	71,666	481
Paloma	1,247	2,027	24,473	17
Pleasant Valley	936	1,171	11,329	17
Pyramid Hills	66	66	934	14
Race Track	7	7	113	1
Raisin City, East	218	885	4,115	8
Raisin City, West	713	796	5,729	19
Rio Bravo	5,920	27,730	72,270	100
Riverdale	1,525	2,210	14,290	45
Round Mountain	3,939	43,204	37,046	295
Shafter	6	52	48	1
Sheep Springs	33	33	447	2
Strand, East	180	278	2,222	6
Strand, West	634	2,863	7,137	17
Tejon	58	62	688	7
Ten Section	4,631	31,584	58,416	119
Union Avenue	38	195	1,055	3
Wasco	821	3,789	6,211	13
Wheeler Ridge	91	4,205	795	34
Miscellaneous small fields	6	6	9	7
Total	147,552	2,854,894	1,716,455	12,113

COASTAL DISTRICT

Aliso Canyon	1,100	4,279	21,121	26
Capitan	1,079	8,749	11,251	53
Del Valle	619	1,980	8,020	17
Elwood	2,133	72,992	19,008	57
Gato Ridge	1,780	9,797	17,203	30
Goleta	.....	136	.....	0
Newhall Potrero	1,911	7,456	21,294	46
Oak Canyon	416	903	5,097	9
Padre Canyon	475	2,695	4,305	21
Rincon	1,502	17,831	12,419	87
San Martinez	853	1,652	3,388	23
San Miguelito	2,109	10,981	44,019	31
Santa Barbara	35	3,601	399	14
Santa Maria	4,879	152,940	68,871	310
Santa Maria Valley	11,281	49,419	100,581	343
Summerland	3	3,179	21	5
Ventura Avenue	17,507	285,453	169,547	487
Ventura-Newhall	2,237	69,753	12,247	528
Watsonville	9	1,511	39	7
Total	49,928	705,307	518,830	2,094

LOS ANGELES BASIN

Brea Olinda	4,310	172,671	52,329	409
Buena Park	37	124	176	2
Coyote, East	1,973	49,655	20,346	144
Coyote, West	4,459	139,147	40,853	136
Dominguez	7,879	155,286	79,714	308
El Segundo	337	11,265	2,735	33
Huntington Beach	17,165	344,033	145,967	794
Inglewood	6,477	145,959	54,041	303
Lawndale	11	1,153	97	3
Long Beach	10,858	702,612	87,388	1,143
Los Angeles-Salt Lake	176	66,742	1,132	97
Montebello	3,927	139,277	30,923	348
Newport	4	137	42	1
Playa Del Rey	948	51,252	8,748	111
Potrero	406	5,363	1,897	26
Richfield	2,567	103,682	26,318	320
Rosecrans	2,245	55,497	19,503	197
Santa Fe Springs	6,838	496,562	68,438	559
Seal Beach	2,835	98,621	33,879	141
Torrance	3,184	113,851	31,149	680
Turnbull Canyon	87	331	669	5
Whittier	381	26,404	3,636	163
Wilmington	36,943	245,270	329,730	1,314
Yorba Linda	271	608	4,392	13
Total	114,318	3,125,502	1,044,102	7,250
Total California	311,798	6,685,703	3,279,387	21,457

ROCKY MOUNTAIN AREA

MONTANA

Cut Bank	5,475	42,373	54,000	779
Elk Basin	660	660	15,000	38
Kevin and Border	1,945	45,518	17,480	974
Pondera	240	6,665	2,640	121
Miscellaneous	355	18,992	3,560	138
Total Montana	8,675	114,208	92,680	2,050

COLORADO

Clark's Lake	52	52	700	4
Florence	68	13,871	450	50
Fort Collins-Wellington	118	7,483	1,080	19
Hiawatha	108	595	550	8
Iles Dome	455	10,549	4,000	28

COLORADO (Continued)
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
McCallum, N. and S.	45	130	2,500	7
Moffat	115	6,161	500	11
Powder Wash	44	162	940	4
Price	240	2,120	2,500	9
Rangely	325	1,914	14,400	20
Tow Creek	43	1,875	300	6
Wilson Creek	1,420	3,585	30,000	16
Total Colorado	3,033	48,497	57,920	182

WYOMING

Big Muddy	480	28,294	4,800	153
Byron	2,000	11,929	15,000	37
Circle Ridge	270	562	1,350	10
Cole Creek	508	1,799	12,000	34
Dallas Derby	155	3,680	2,100	34
Elk Basin	3,200	16,880	153,000	181
Frannie	918	8,794	9,200	34
Garland	443	6,326	24,000	24
Grass Creek	1,030	33,592	20,000	343
Hamilton Dome	450	6,887	8,110	33

WYOMING (Continued)
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Hudson	90	2,495	900	28
La Barge	590	9,388	5,620	141
Lance Creek	6,660	63,170	46,400	333
Lost Soldier	1,305	28,596	35,000	94
Mahoney	344	1,820	2,540	2
Maverick Springs	495	2,369	3,500	40
Medicine Bow	223	4,492	1,200	7
Mule Creek	113	1,771	1,100	42
Notches	118	435	1,650	8
Oregon Basin	4,475	34,257	140,000	123
Osage	167	5,335	1,670	190
Pilot Butte	370	1,600	1,850	13
Poison Spider-South Casper	230	4,550	2,300	36
Quealey Dome	175	1,699	1,600	11
Rock River	937	23,551	4,000	81
Salt Creek	4,810	312,870	58,400	1,770
Wertz	2,065	10,687	45,000	23
Miscellaneous	1,202	14,892	17,520	164
Total Wyoming	33,463	632,720	619,810	3,833

PRODUCTION AND RESERVES—TEXAS

(In thousands of barrels)

TEXAS PANHANDLE

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Carson County	5,114	52,897	85,100	770
Gray County	16,164	230,289	240,000	2,494
Hutchinson County	12,034	190,428	180,500	2,165
Moore County	166	5,665	2,500	15
Wheeler County	1,179	24,491	12,600	400
Total Panhandle	34,657	503,770	520,700	5,844

WEST TEXAS

Barnhart	900	1,257	25,950	37
Big Lake	1,540	101,538	15,400	191
Cedar Lake	700	1,741	11,860	56
Cowden-Foster:				
North Cowden	9,280	37,211	106,900	637
South Cowden	1,400	5,028	13,140	125
Emma	350	2,451	15,670	70
Foster	6,160	24,231	36,520	585
Johnson	1,380	4,057	24,740	126
Fullerton	2,700	3,142	164,100	137
Fuhrman-Mascho	1,195	5,799	28,170	172
Goldsmith-Harper:				
Goldsmith and North	8,625	55,287	326,000	998
Embar-West Andrews	1,263	2,116	19,810	51
Harper	614	9,110	9,590	184
Hendricks-Kermit:				
Eaves	430	1,342	2,700	18
Emperor	525	4,426	5,190	128
Halley	185	1,230	3,900	44
Henderson	1,880	9,834	20,670	129
Hendricks	1,720	208,148	15,600	253
Kermit	1,130	32,160	13,000	741
Keystone and Ellenburger	2,340	13,649	40,000	401
Leck	170	4,215	1,300	11
Scarborough	335	7,717	5,050	121
Weiner	540	890	3,510	54
Wheeler	250	289	8,610	7
Howard-Glasscock	4,790	113,912	49,900	841
Iatan-Snyder	1,670	21,951	17,740	459
McCamey district:				
McCamey	3,320	61,470	41,930	816
Crane-Cowden	132	5,683	920	98
McElroy	10,400	143,458	87,200	616
Mabee	290	290	11,710	33
Means	1,275	8,109	58,850	115
Pecos Valley district:				
Abell	1,260	3,315	20,690	110
Apco	675	1,261	12,540	48
Lehn	64	517	450	58
Pecos Valley	220	3,141	2,420	161
Peyton	250	3,421	1,250	130
Shearer	118	1,487	350	46
Walker	390	1,140	4,940	74
Penwell-Jordan:				
Dune-Edwards	210	957	4,000	25
Jordan	2,390	9,799	31,600	221
Penwell	1,200	25,474	17,220	161
Waddell	1,631	6,549	60,500	104
Sand Hills	2,800	12,577	55,300	237
Seminole	8,920	17,135	99,350	334
Sharon Ridge	353	2,075	5,300	186
Slaughter and Dean	23,981	49,958	400,000	1,822
Taylor-Link	510	8,795	5,060	140
Todd	110	392	5,600	20
Union	290	299	5,460	10
Ward, North:				
Magnolia-Sealey and South	395	2,118	8,680	70
North Ward-Monahans	3,410	30,886	47,270	430
Spencer	75	204	1,900	11
Byrd	50	50	840	6
Ward, South:				
Estes-Dobbs	1,570	17,204	40,800	341
Shipley	530	6,714	14,600	137
South Ward	735	28,742	7,350	535
Wasson	24,500	78,850	482,000	1,519
Westbrook	495	10,124	6,200	151
Wheat	272	9,437	3,560	98
World	720	9,139	8,000	90
Yates district:				
Crockett	85	536	1,200	40
Noelke	300	671	2,700	42
Tobarg	480	8,478	5,000	220
White and Baker	140	511	4,300	34
Yates	12,000	287,688	377,000	576
Miscellaneous W. Texas	2,182	6,768	29,280	253
Total West Texas	161,400	1,540,063	2,958,340	16,740

NEW MEXICO

Lea County:				
Arrowhead	1,946	5,921	22,133	124
Cooper	616	14,657	4,727	79
Eaves	378	2,182	3,440	28
Eunice	6,470	65,290	78,250	494
Eunice, South	813	6,426	10,261	62
Eunice, West	354	787	3,859	22
Halfway	70	337	693	6
Hardy-Skaggs	360	5,042	4,598	127
Hobbs	4,120	104,179	66,701	253
Jal	137	6,488	1,375	19
Langlie	743	8,615	7,142	119
Lusk, E. and W.	53	150	547	9
Lynch, and N.	126	7,310	1,164	11
Lynn	361	1,916	2,973	39
Maljamar, and S. and E.	2,117	7,391	26,492	219
Mattix	678	7,769	6,053	101
Monument	7,570	58,775	108,655	494
Penrose	511	8,349	5,140	191
Rhodes	287	702	2,511	32
Salt Lake	50	146	404	9
Skelly	271	3,393	2,336	94

NEW MEXICO (Continued)
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	Estimated reserves	No. of wells
South Lovington	637	2,230	7,133	57
Vacuum	5,080	21,522	100,398	355
Eddy County:				
Anderson-Leonard	498	1,800	4,202	69
Artesia	160	4,979	1,611	177
Barber-Getty	207	1,318	1,475	29
Grayburg-Jackson	1,983	13,516	22,501	270
Loco Hills	1,119	7,821	17,060	193
Red Lake	71	680	749	57
Shugart-Leo	157	934	1,409	37
Square Lake	1,148	1,388	19,964	167
Misc. S.E. New Mex.	212	690	1,490	41
Misc. N.W. New Mex.	448	8,976	4,480	81
Total New Mexico	39,751	381,669	541,926	4,122

NORTH CENTRAL TEXAS

Archer County:				
Hull-Silk-Sikes	4,280	18,893	43,110	434
Miscellaneous	3,840	135,423	42,240	3,278
Total	8,120	154,316	85,350	3,712
Baylor County	620	7,255	6,600	169
Clay County:				
Antelope	610	1,924	6,070	55
Miscellaneous	2,670	16,798	29,500	1,075
Total	3,280	18,722	35,570	1,130
Cooke County:				
Walnut Bend	2,620	8,253	15,480	166
Miscellaneous	1,985	25,665	18,800	1,100
Total	4,605	33,918	34,280	1,266
Foard County	55	2,149	250	15
Jack County	2,045	25,280	22,990	775
Montague County:				
Hildreth	1,170	6,361	16,150	80
Miscellaneous	3,370	38,411	44,110	1,153
Total	5,540	44,772	50,260	1,233
Wichita County:				
K.M.A.	9,670	61,382	149,000	1,757
Miscellaneous	3,610	336,703	43,300	5,228
Total	13,280	398,085	192,300	6,985
Wilbarger County:				
Fargo	980	3,340	6,000	49
Miscellaneous	2,720	81,193	26,500	1,538
Total	3,700	84,533	32,500	1,587
Young County	3,520	82,555	38,720	2,393
Total North Texas	44,765	851,585	498,320	19,265

WEST CENTRAL TEXAS

Brown County	390	32,126	4,290	793
Callahan County	220	15,698	1,980	1,113
Coleman County	805	13,706	9,660	423
Comanche County	80	1,972	640	104
Eastland County	750	100,986	8,000	400
Erath County	22	758	220	14
Fisher County	437	14,317	4,370	141
Haskell County	20	245	200	12
Jones County	3,470	29,224	28,200	798
Palo Pinto County	75	5,247	500	109
Shackelford County	1,775	48,730	26,620	2,013
Stephens County	1,270	130,443	13,500	627
Stonewall County	28	228	170	6
Taylor County	355	1,407	3,800	57
Throckmorton County	233	4,290	1,580	276
Total W. C. Texas	9,930	399,377	103,730	6,848

EAST TEXAS

Cayuga	2,997	32,192	35,000	231
Chapel Hill	635	1,979	12,255	47
Coke	845	1,367	5,815	30
East Texas field	134,674	2,114,621	2,530,000	24,196
Hawkins	13,449	34,921	165,000	404
Long Lake and East	1,960	9,598	31,500	153
Manziel	490	573	5,430	28
Mexia	506	99,303	7,590	175
New Hope	930	1,051	14,950	35
Powell	473	116,853	6,620	149
Quitman	2,061	2,669	18,300	58
Rodessa	1,690	55,272	5,100	312
Sulphur Bluff	1,419	12,323	21,300	71
Talco	8,601	76,000	93,000	712
Trinity	174	2,222	1,260	15
Van	11,651	150,992	290,000	590
Wieland	162	308	2,200	10
Miscellaneous	1,810	26,544	16,290	920
Total	184,527	2,738,788	3,261,610	28,136

SOUTH CENTRAL TEXAS
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	Estimated reserves	No. of wells
Bastrop County:				
Hilbig	310	2,129	2,270	12
Miscellaneous	47	1,580	410	23
Total	357	3,709	2,680	35
Bexar County:				
Somerset	62	11,700	620	374
Miscellaneous	69	2,215	840	385
Total	131	13,915	1,460	759
Caldwell County:				
Luling-Branyon	1,660	82,204	24,900	692
Lytton Springs	83	8,715	1,200	130
Salt Flat and North	705	45,303	6,300	248
Tenney Creek	120	413	1,700	23
Miscellaneous	80	3,736	800	93
Total	2,648	140,371	34,900	1,186
Frio County: Caldwell	385	2,336	4,065	43
Guadalupe County:				
Darst Creek	3,385	59,742	20,260	339
Miscellaneous	36	640	510	48
Total	3,421	60,382	20,770	387
La Salle County:				
Washburn	340	562	3,640	22
McMullen County:				
Ezzell	230	3,170	2,300	124
Jacobs	78	1,831	860	71
Miscellaneous	165	1,651	1,510	84
Total	473	6,652	4,670	279
Miscellaneous	292	12,198	1,960	684
Total S. C. Texas	8,047	240,125	74,145	3,395

SOUTH TEXAS

Brooks County:				
Alta Mesa & East	413	1,782	2,480	33
Scott & Hopper	90	90	2,110	4
Dan Sullivan	5	5	315	1
Total	508	1,877	2,905	38
Duval County:				
Benavides and East	1,425	13,797	13,200	194
Casa Blanca & W&N	390	1,395	3,205	76
Cedro Hill	350	1,313	3,340	78
Charamousca and S.	105	969	1,570	23
Driscoll	1,070	6,953	10,050	63
Eagle Hill	195	2,184	2,900	50
Fitzsimmons	315	3,298	5,000	74
Government Wells	2,585	54,705	22,290	621
Hoffman	1,570	11,978	13,020	307
Loma Novia	1,395	29,648	18,130	516
Longhorn	340	2,569	4,320	40
Lundell	370	2,193	4,310	94
Piedre Lumbre	925	4,959	8,300	130
Sarnosa	97	2,874	970	34
Sejita	420	564	19,440	26
Seven Sisters & S.	2,420	22,144	19,070	410
Tarancahaus	175	787	1,220	27
Miscellaneous	741	5,010	8,480	152
Total	14,898	167,340	158,815	2,915
Hidalgo County:				
Nichols	104	386	1,560	12
Sam Fordyce	82	8,265	575	44
Sullivan City	194	806	3,110	23
Total	380	9,457	5,245	79

SOUTH TEXAS (Continued)
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Jim Hogg County:				
Colorado	805	3,690	7,210	240
Kelsey	865	3,414	15,600	76
Miscellaneous	538	9,142	5,500	158
Total	2,208	16,246	28,310	474
Starr County:				
Boyle	160	455	1,500	17
Guerra	225	1,646	3,355	15
Sun & North	1,760	4,097	16,900	111
Rincon & North	2,900	9,234	24,770	171
Ytturia	110	289	1,100	15
Cameron	150	168	1,850	14
Miscellaneous	348	2,327	6,625	171
Total	5,653	18,216	56,100	514
Webb County:				
Adami	64	615	585	47
Aviator	79	6,342	645	74
Cole-Bruni-Ohern	720	19,790	4,320	243
Glen	490	1,750	4,650	67
Killiam and North	123	1,482	740	79
Lopez	880	13,295	5,290	296
Mirando City	84	9,501	1,000	49
Volpe	157	760	1,540	28
Miscellaneous	254	6,927	1,900	82
Total	2,851	60,462	20,670	965
Zapata County:				
Comitas	97	9,835	875	142
Escobas-Jennings	515	3,420	6,180	308
Mirando Valley	20	1,549	50	40
Miscellaneous	166	3,018	800	28
Total	798	17,822	7,905	518
Total South Texas	27,286	291,420	279,950	5,503

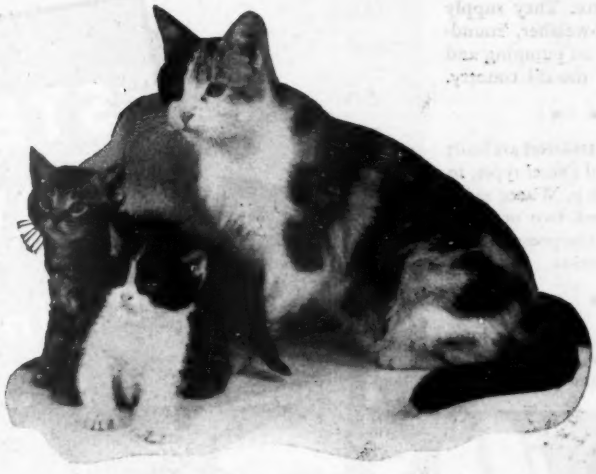
LOWER GULF COAST

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Aransas County:				
Aransas Pass	1,460	13,670	12,330	173
Miscellaneous	2	12	30	1
Total	1,462	13,682	12,360	174
Bee County:				
Caesar and South	655	2,149	9,450	45
Dirks	385	6,573	2,530	84
Pettus and New	358	10,136	2,970	78
Miscellaneous	249	8,352	3,000	57
Total	1,647	27,210	17,950	264
Calhoun County:				
Heyser	3,390	23,994	31,920	213
Jay Welder	93	261	950	5
Miscellaneous	34	670	430	4
Total	3,517	24,925	33,300	222
DeWitt-Goliad County:				
Slick	790	852	6,500	39
Miscellaneous	16	1,096	600	5
Total	806	1,948	7,100	44
Karnes County:				
Hobson	250	382	2,620	11
Porter	238	319	2,400	13
Miscellaneous	172	1,252	2,050	34
Total	660	1,953	7,070	58
Kleberg County	24	830	250	4
Jim Wells County:				
Alfred	182	617	1,885	20
Alice and East	873	5,941	10,460	80
Ben Bolt	860	3,568	6,940	64
Gandy	93	224	1,780	9
Magnolia City & N.	248	452	3,600	17
Orange Grove	485	2,117	6,790	25
Reynolds	155	1,519	2,110	20
Seligson	7,260	9,538	190,462	33
Wade City	925	4,388	11,950	92
Miscellaneous	191	3,040	5,478	33
Total	11,272	31,404	241,455	692
Live Oak County:				
Oakville	130	1,137	490	22
White Creek and S.	81	716	400	35
Miscellaneous	52	813	630	9
Total	263	2,666	1,520	66
Nueces County:				
Agua Dulce-Stratton	7,435	16,835	82,200	378
Baldwin	170	1,103	1,200	20
Clara Driscoll & S.	940	6,507	10,710	110
Flour Bluff & East	1,475	10,159	15,840	90
Luby and North	1,450	10,085	15,915	149
Minnie Bock	665	3,349	5,990	63
Richard King	1,190	4,620	11,040	97
Saxet	2,480	47,371	27,130	264
Shield	142	307	1,590	10
Turkey Creek	480	5,170	6,270	47
Miscellaneous	499	7,870	5,250	38
Total	16,926	113,576	183,135	1,271
Refugio County:				
Greta	3,350	32,972	21,030	202
La Rosa	1,670	6,036	16,200	86
Mellon Creek	166	910	1,780	10
Refugio-Mission Riv.	2,085	52,354	16,725	174
Tom O'Connor	18,300	65,023	385,000	448
Woodsboro	152	295	1,710	7
Miscellaneous	61	906	500	11
Total	25,784	158,496	442,945	938
San Patricio County:				
Midway	1,190	4,707	11,790	68
Odem	775	1,837	7,365	61
Plymouth	3,505	32,567	31,430	186
Taft	1,100	6,902	9,600	77
White Point and E.	4,420	19,685	37,080	242
Total	10,990	65,698	97,265	634
Victoria County:				
Colleto Creek	175	1,838	1,760	33
Cologne	90	290	910	8
Keeran	240	1,811	2,790	18
McFaddin & North	1,685	7,075	18,530	93
Placedo & East	2,260	18,362	17,738	181
Miscellaneous	60	172	922	17
Total	4,510	29,548	42,650	350
Willacy County:				
Willamar	1,200	1,424	35,500	63
Lower G. C. Total	79,061	473,360	1,122,500	4,780

UPPER GULF COAST

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Austin County:				
Raccoon Bend	3,700	31,998	18,000	157
Miscellaneous	45	66	935	1
Total	3,745	32,064	18,935	158
Brazoria County:				
Chocolate Bayou	100	473	1,980	2
Danbury	350	1,452	2,150	21
Hastings	21,800	85,420	285,700	677
Lochridge	680	5,234	5,020	41
Manvel	3,010	28,932	17,070	159
Old Ocean	5,450	28,395	27,000	123
Rowan	335	796	3,500	7
West Columbia	2,140	93,765	17,935	150
Miscellaneous	237	8,678	4,830	33
Total	34,102	253,145	363,785	1,212
Chambers County:				
Anahuac	11,700	44,185	225,000	357
Barbers Hill	2,200	81,424	15,400	121
Cedar Point	700	2,630	5,320	16
Cotton Lake & S.	440	4,620	2,640	38
Fig Ridge	2,425	3,520	5,450	55
Fishers Reef	47	138	365	2
Oyster Bayou	2,245	3,587	6,610	20
Red Fish Reef	705	1,743	5,150	14
Seabreeze	490	1,357	6,010	14
Turtle Bay	530	4,438	3,830	30
Willow Slough	100	693	980	5
Miscellaneous	3	1,123	3,400	2
Total	21,585	149,458	280,155	683
Colorado County:				
Sheridan	47	252	180	3
Miscellaneous	41	184	2,200	5
Total	88	436	2,380	8
Fort Bend County:				
Big Creek	195	10,513	1,985	15
Blue Ridge	200	11,653	1,000	41
Clodine	263	758	3,420	24
Sugarland	2,925	36,069	53,930	45
Thompson	13,475	62,403	207,597	338
Miscellaneous	45	6,602	355	17
Total	17,103	127,998	268,287	480

Cats to Kittens



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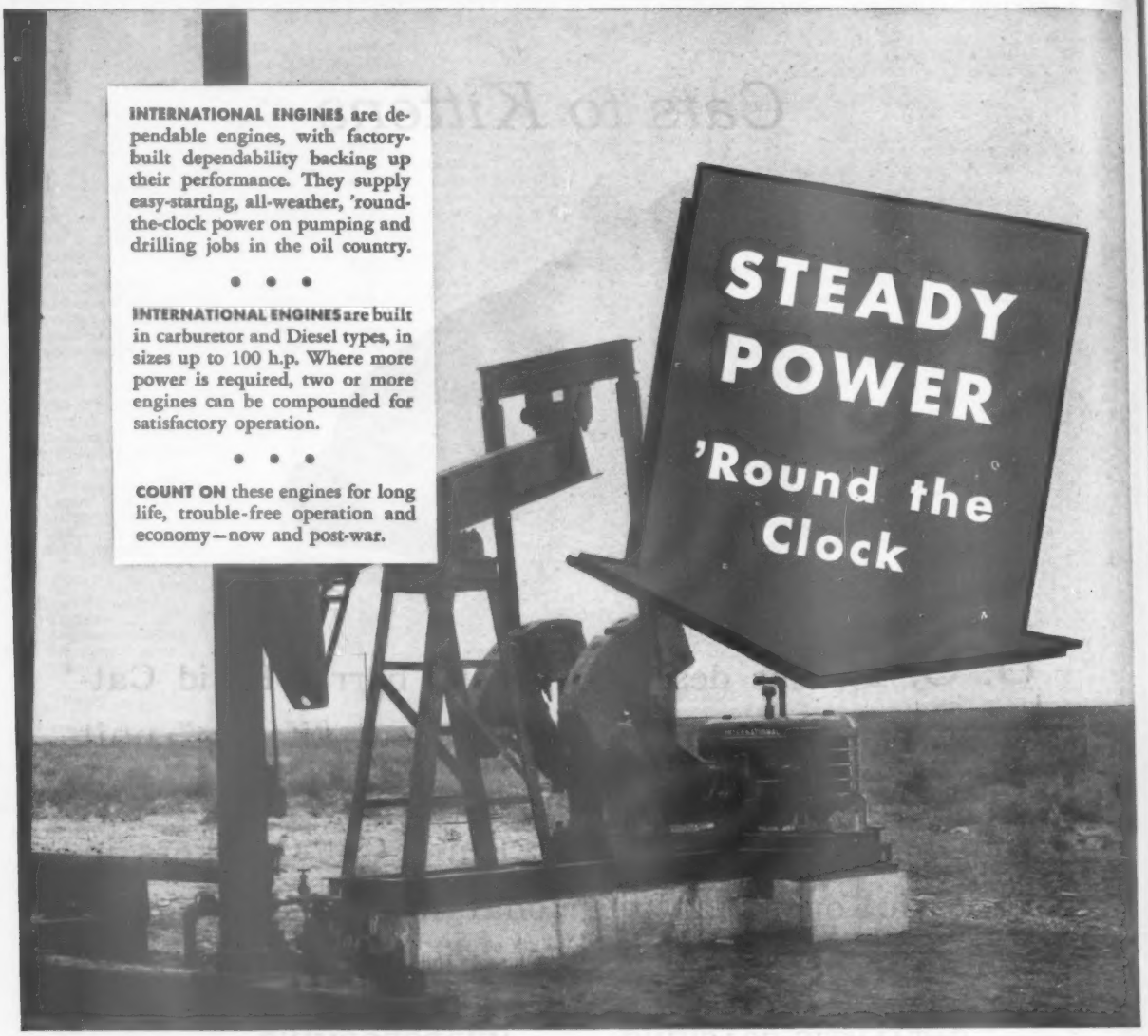

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UPPER GULF COAST (Continued)

(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Galveston County:				
Alta Loma	170	836	2,380	6
Capien	410	1,235	2,765	17
Dickinson-Gillock	1,910	18,759	17,240	146
High Island	845	20,649	12,675	57
Hitchcock	185	1,414	610	13
League City	1,070	4,177	6,400	32
Miscellaneous	14	141	50	1
Total	4,604	47,211	42,120	272
Hardin County:				
Arriola	130	2,559	1,300	12
Batson	224	42,207	3,360	150
Saratoga	190	30,390	1,200	210
Silsbee & West	710	4,799	6,340	41
Sour Lake	540	81,150	5,000	133
Miscellaneous	20	28	860	3
Total	1,814	161,133	18,060	549
Harris County:				
Clear Lake	1,965	3,920	24,080	37
Dyersdale	700	2,091	4,010	62
Eureka Heights	465	4,158	6,535	25
Fairbanks	2,835	16,701	23,300	294
Goose Creek	445	78,620	6,000	84
Humble	800	126,650	8,350	218
Mykawa	95	4,769	350	29
Pierce Junction	480	37,156	6,720	55
Richardson-Joyce	145	208	1,600	8
Satsuma	160	1,103	1,340	10
South Houston	1,830	10,860	16,100	86
Tomball	3,840	29,972	25,030	448
Webster	20,600	44,692	306,000	207
North Houston	48	389	2,600	4
Miscellaneous	130	45,818	1,300	11
Total	20,778	407,107	433,315	1,578
Jackson County:				
Cordele	360	3,002	3,800	44
Francitas	168	571	1,030	13
Ganado	495	1,447	2,600	5
Ganado, West	615	1,480	16,020	39
Harmon	185	482	3,150	17
Lolita	2,130	7,943	31,950	177
Maurbro	645	1,747	17,500	75
Mauritz & W. & E.	495	1,441	4,500	16
Mayo	515	942	5,060	40
North La Ward	920	2,234	22,770	103
West Ranch	8,100	26,145	205,000	411
Miscellaneous	125	269	3,620	14
Total	14,753	47,703	317,000	954
Jefferson County:				
Amelia	1,690	10,479	14,550	98
China, South	250	927	3,500	12
Clam Lake	270	894	3,605	15
Fannett	1,535	6,105	10,140	37
La Belle	325	798	2,750	8
Lovell's Lake	1,975	8,317	36,780	110
Spindletop	345	129,125	3,450	121
Stowell	5,380	7,429	22,500	81
West Beaumont	630	5,929	8,190	53
Miscellaneous	567	592	5,100	36
Total	12,967	170,595	110,565	571
LaVaca County—Misc.			630	2
Liberty County:				
Esperson & South	905	10,213	7,290	88
Hankamer	295	6,977	3,250	30
Hardin	1,285	10,908	19,270	124
Hull	1,625	99,655	15,375	161
Kirby	275	336	4,665	8
Martha	160	810	1,120	12
South Liberty	108	16,122	970	39
Miscellaneous	44	2,458	1,040	11
Total	4,697	147,479	52,980	471
Matagorda County:				
Bay City & N	2,160	11,364	12,300	69
Hamman	338	1,330	1,350	19
Markham	362	4,455	1,600	37
North Markham	1,640	8,279	17,720	39
Miscellaneous	121	1,767	1,000	10
Total	4,621	27,195	33,970	174
Montgomery County:				
Conroe	24,200	186,272	515,000	900
Miscellaneous	51	154	500	4
Total	24,251	186,426	515,500	904
Orange County:				
Orange and West	437	37,071	2,620	74
Port Neches and W.	640	7,472	4,210	45
Total	1,077	44,543	6,830	119
Polk County:				
Livingston	580	8,413	5,040	84
Segno	1,380	9,514	11,040	106
Miscellaneous	88	684	900	8
Total	2,048	18,611	16,980	198
San Jacinto County:				
Mercy	1,095	2,146	8,000	38
Tyler County:				
Camp Eleven	124	289	915	2
Joe's Lake	421	4,161	3,840	42
Miscellaneous	164	253	1,500	6
Total	709	4,703	6,255	50
Waller County:				
Katy	190	246	130,000	11
Washington County:				
Clay Creek	250	5,213	2,400	48
Miscellaneous	2	388	40	6
Total	252	5,601	2,440	54
Wharton County:				
Boling	375	8,712	3,150	45
Hillje	175	845	1,255	13
Louise	350	4,582	2,450	33
Magnet Withers	6,600	26,728	58,300	398
Pickett Ridge	725	7,607	6,390	64
Miscellaneous	21	68	1,200	3
Total	8,246	48,542	72,745	556
Total Upper G. C.	192,485	1,882,342	2,700,932	9,042

PRODUCTION AND RESERVES—LOUISIANA

SOUTH LOUISIANA

(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Anse La Butte	2,614	9,919	19,050	85
Barataria	1,139	4,773	10,225	21
Bayou Sale	3,096	6,079	28,000	41
Caillou Island	1,915	37,472	13,370	55
Chalkely	1,246	7,115	10,150	33
Charenton	1,052	11,968	9,590	140
Delta Farms	2,174	3,553	31,500	31
East White Lake	1,056	1,914	19,100	18
Eola	3,182	20,929	21,320	97
Erath	3,844	4,437	96,563	46
Garden Island	1,256	8,607	8,850	40
Gibson, and E. and N.E.	3,615	12,742	22,260	47
Golden Meadow	2,814	20,564	27,760	175
Grand Bay	2,727	11,032	19,700	42
Gueydan and W.	1,955	6,788	13,150	44
Hackberry, E.	1,715	33,402	20,580	60
Hackberry, W.	2,336	14,050	19,950	89
Iberia	2,630	32,221	39,450	88
Iowa	3,362	55,055	24,900	67
Jennings	2,831	86,965	20,035	121
Lafitte	4,453	40,173	44,530	60
Lake Salvador	1,579	3,972	11,020	25
Leeville	1,421	26,826	14,210	78
Neale	2,350	5,742	18,240	45
North Crowley	1,645	9,980	13,020	40
Paradis	4,003	11,837	44,160	65
Pine Prairie	1,943	4,495	12,250	59
Port Barre	1,166	13,198	17,490	54
Quarantine Bay	2,917	12,619	20,500	44
St. Gabriel	1,955	5,572	27,370	28
University	2,349	17,248	31,525	76
Venice	3,327	9,976	18,025	34
Ville Platte	3,723	29,444	39,555	252
Vinton	1,949	46,076	9,700	101
West Bay	1,065	3,126	8,650	22
West Lake Verrett	1,037	3,717	7,360	26
White Castle	1,483	8,875	10,725	23
Miscellaneous	25,226	41,521	169,530	1,076
Total S. Louisiana	109,150	683,982	993,363	3,438

NORTH LOUISIANA

Bellevue	207	10,997	2,890	169
Caddo	2,124	159,950	19,110	1,482
Catahoula Lake	170	331	2,050	5
Converse	82	2,567	490	76

NORTH LOUISIANA (Continued)

(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Cotton Valley	3,180	46,449	38,550	150
Elm Grove	107	3,738	1,100	40
Haynesville	3,834	84,355	40,010	341
Holly Ridge and N.	829	869	8,900	24
Homer	832	73,838	6,650	341
Lake St. John	642	1,035	26,800	30
Little Creek-Zenoria	840	3,578	5,880	62
Lisbon	604	11,261	5,330	165
Nebo	3,380	11,021	21,980	144
Olla and S.	3,376	17,202	28,160	197
Red River	332	57,737	4,650	123
Rodessa	2,950	82,154	17,700	368
Shreveport-Cross Lake	691	691	5,220	51
Sligo	443	4,458	3,040	88
Sugar Creek	359	2,327	3,070	43
Urania	688	27,272	6,880	276
Willow Lake	102	303	890	2
Zwolle	143	15,029	760	48
Miscellaneous	341	7,200	3,070	51
Total N. Louisiana	26,256	624,382	253,180	4,276

PRODUCTION AND RESERVES—ARKANSAS

Atlanta	1,170	4,984	11,250	36
Buckner	670	4,726	9,380	28
Calhoun	25	25	1,175	3
Champagnolle	235	15,664	3,525	74
Dorcheat-Macedonia	2,135	6,002	25,000	94
El Dorado	300	49,352	3,300	165
El Dorado, East	230	10,032	2,300	68
Fouke	580	1,589	5,410	34
Garland City	64	2,222	370	8
Haynesville	520	723	8,270	29
Irma-Troy	520	10,671	7,800	123
Magnolia	5,610	36,322	69,150	116
McKamie	1,120	3,192	14,310	20
Midway	2,370	5,763	42,240	40
Mount Holly	315	783	3,420	16
New London	460	883	3,120	19
Rodessa	200	7,020	3,000	53
Salem-Church	9	9	391	2
Schuler and East	5,140	43,162	41,540	85
Smackover	4,290	402,666	47,190	1,563
Stephens	1,830	10,845	14,110	301
Urbana	550	8,384	2,750	67
Village	542	2,549	5,440	18
Wilkes	13	13	387	1
Miscellaneous	218	8,834	1,940	169
Total Arkansas	29,116	636,415	326,768	3,132

MISSISSIPPI-ALABAMA

MISSISSIPPI

Baxterville	2	2	500	1
Brookhaven	1	18	180	1
Carey	12	42	60	1
Cranfield	522	534	24,466	12
Eucutta	456	458	19,542	34
Flora	6	11	60	1
Gwinville	1	1	3,000	3
Heidelberg	1,457	1,457	48,543	55
Mallalieu	35	35	765	1
Pickens	2,177	4,569	20,430	41
Tinsley	11,836	76,881	35,220	312
Total Mississippi	16,505	84,006	152,766	462

ALABAMA

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Gilbertown	53	53	1,447	8
Melvin	2	2	48	1
Total Alabama	55	55	1,495	9

PRODUCTION AND RESERVES—OKLAHOMA

North Central District

Garfield, Grant, Kay and Logan counties:				
Blackwell district	130	6,692	1,920	39
Billings	1,490	22,724	10,430	79
Braman district	287	22,926	1,720	101
Crescent district	1,124	16,087	9,400	79
Dilworth	218	6,020	1,960	78
Garber	612	56,963	8,400	541
Guthrie	375	3,060	1,890	33
Hubbard	128	8,783	1,790	33
Langston and South	120	1,987	840	15
Lovell and South	270	3,661	2,830	23
Lucien district	1,363	34,234	10,900	137
Navina and South	47	288	240	8
Otoe	365	721	980	23
Polo	155	4,656	1,050	25
Tonkawa	410	122,888	5,710	145
Vernon	130	3,741	1,260	27
Miscellaneous	712	46,527	5,290	121
Total N. C. district	7,936	361,958	66,610	1,511

Northeastern District

Burbank	3,140	214,884	38,480	1,688
South Burbank	2,500	38,981	33,020	222
Naval Reserve	730	19,528	5,110	231
Other Osage County	3,335	340,826	32,250	5,807
Nowata County	2,690	) (	23,900	7,498
Rogers County	668	)371,699(	5,340	3,272
Washington County	1,038	) (	10,380	4,063
Total N. E. district	14,101	985,918	148,580	22,781

East Central District

Bristow-Slick	785	141,229	9,800	398
Cushing-Shamrock	2,940	368,349	30,170	1,690
Glenn-Sapulpa	2,245	259,192	17,800	1,896
Manford-Olive	284	11,934	2,400	401
Stroud, E. and S.E.	600	1,537	2,400	682
Other Creek County	1,694	28,385	13,600	626
Muskogee-McIntosh counties	188	13,483	1,880	450
Eastern Okfuskee County	800	59,206	12,000	407
Okmulgee County	858	110,411	9,430	1,747
Tulsa County	695	124,825	10,500	2,669
Wagoner County	150	7,544	1,050	400
Total E. C. district	11,239	1,126,095	111,030	11,366

Seminole District

Coal County	24	223	145	7
Hughes County:				
Adams	200	2,031	2,000	10
Fish	588	19,377	2,940	139
Holdenville	186	5,804	3,790	104
Horns Corner	445	601	2,555	9
Horns Corner, North	120	120	680	8
Papoose	150	22,352	1,650	84
Miscellaneous	235	5,662	2,585	64
Total	1,924	55,947	16,200	385
Okfuskee County:				
Dill, and N.E.	385	5,578	1,710	98
East Cromwell	650	4,100	2,600	71
Olympic	385	12,686	3,465	317
Rusk	210	1,328	900	10
Miscellaneous	385	2,728	2,750	44
Total	2,015	26,420	11,425	537
Pontotoc County:				
Bebee district	840	15,362	5,880	232
Fitts	2,150	102,045	12,900	644
Jesse	565	6,795	7,345	56
Miscellaneous	170	3,208	450	232
Total	3,725	127,410	26,575	1,164
Pottawatomie County:				
Asher and West	101	11,443	1,000	35
Avoca	82	1,595	410	18
Brooksville	190	676	1,320	11
Gray	310	5,103	4,560	23
Hotulke and West	210	1,625	1,000	18
Maud and South	195	13,165	1,365	61
Prague	155	1,157	775	17
Romulus	116	1,536	230	18
Shawnee district	670	4,584	4,130	61
St. Louis district	2,690	167,072	13,500	724
Tecumseh Lake	94	1,182	250	9
Tecumseh and East	28	743	90	16
Miscellaneous	325	2,785	2,580	116
Total	5,166	212,666	31,210	1,127

OKLAHOMA (Continued)
(In thousands of barrels)

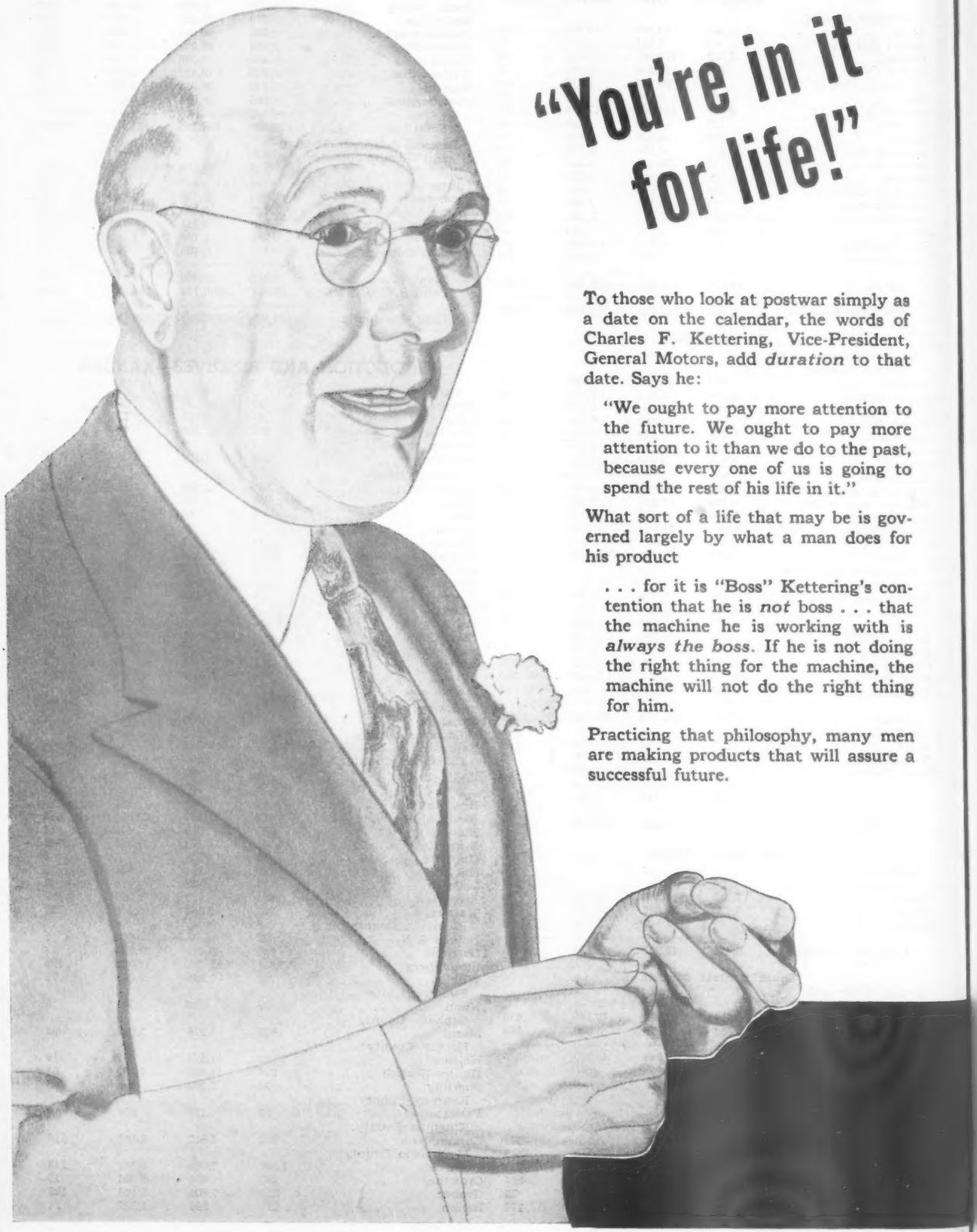
	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	No. of wells
Seminole County:				
Allen	1,285	55,305	18,720	290
Bethel district	345	6,615	3,795	67
Bowlegs	1,525	124,061	13,725	199
Carr City	555	31,316	6,100	71
Cromwell district	862	59,642	9,610	228
Dora	194	5,440	800	102
Earlsboro district	2,495	194,007	17,500	282
Grayson	123	2,348	600	28
Keokuk	560	13,830	2,800	82
Konawa district	465	18,575	3,720	145
Little River district	1,741	135,435	8,250	281
Mission	295	28,439	3,250	45
Sasakwa district	318	11,929	3,840	68
Searight district	432	39,477	4,750	71
Seminole district	2,240	156,871	15,680	308
Traugh	101	2,174	500	33
Wewoka district	884	47,205	5,495	152
Miscellaneous	494	9,358	6,050	124
Total	14,914	942,027	125,185	2,576
Total Seminole dist.	27,768	1,364,693	210,740	4,625
Central District				
Lincoln, Pawnee and Payne counties:				
Chandler-Hoyt	247	13,039	3,460	59
Coyle district	1,185	6,987	7,110	36
Cleveland-Keystone	312	43,582	4,370	437
Davenport	175	12,662	1,750	123
Laffoon	180	2,432	2,700	12
Lauderdale	184	13,967	2,570	174
Ramsey	1,250	9,450	11,250	41
Sac & Fox	151	3,667	750	139
Watchorn and East	940	10,001	6,580	38
Wilzetta and South	174	1,829	2,610	17
Yale district	590	42,690	9,000	162
Miscellaneous	1,879	51,086	16,120	576
Total	7,267	211,392	68,270	1,814
Oklahoma and Cleveland counties:				
Britton and South	129	2,908	1,500	22
Edmond and N.E.	1,046	21,381	9,370	93
Moore	201	9,056	1,000	22
Moore, West	290	290	1,460	7
Moore, South	61	61	1,499	2
Oklahoma City	16,295	610,031	97,300	830
West Edmond	7,752	8,074	172,000	309
Miscellaneous	168	987	810	13
Total	25,942	652,788	284,939	1,298
McClain County:				
Byars	87	682	430	10
Washington	26	26	974	1
West Noble	15	15	985	1
Total	128	733	2,389	12
Total Cent. district	33,337	864,913	355,598	3,124
West Central District				
Caddo and Kiowa counties:				
Apache	2,245	6,568	18,530	28
Cement	4,190	32,842	27,150	393
Hobart	43	1,547	210	23
Total W. C. District	6,478	40,957	45,890	444
South Central District				
Bryan, Love and Marshall counties:				
Cumberland	4,414	13,861	46,140	110
Miscellaneous	152	1,779	830	166
Total S. C. district	4,566	15,640	46,970	276
Southwestern District				
Carter, Comanche, Cotton, Garvin, Grady and Stephens counties:				
Duncan district	908	28,755	8,170	947
Graham-Fox	545	43,337	3,810	342
Healdton	2,515	198,272	26,850	1,873
Hewitt	2,055	100,542	14,350	894
Hoover	109	109	851	12
Knox	445	16,594	3,560	177
Loco-Milroy	528	6,552	3,680	232
Lone Grove	190	190	610	13
Pauls Valley	4,200	6,986	26,600	108
Robberson	278	15,904	3,910	166
Sholem-Alechem	805	40,331	11,280	301
Tatums-Tussy	1,681	25,225	14,155	339
Velma	800	7,948	5,480	717
Wildcat Jim	513	18,432	5,640	88
Walters	242	26,214	3,630	213
Miscellaneous	986	18,894	9,030	81
Total	16,800	554,285	141,606	6,503
Jackson, Jefferson, Tillman and Washita counties:				
Altus	160	2,040	1,550	117
Tipton	105	2,077	620	57
Oscar-Seay	384	2,722	5,760	235
Spring	120	3,489	500	38
Frederick and West	246	3,321	720	32
Red River	92	1,703	1,470	80
Washita County	104	105	495	3
Total	1,211	15,466	11,115	562
Total S.E. district	18,011	569,751	152,721	7,065
Total Oklahoma	123,436	5,329,925	1,138,139	51,192

PRODUCTION AND RESERVES—KANSAS

Barber County:				
Deerhead	32	36	204	2
Lake City	34	147	379	3
Sun City	205	316	944	7
Turkey Creek	7	9	31	1
Whelan	239	1,130	1,320	18
Barton County:				
Ainsworth	565	3,748	4,552	83
Ames	58	63	637	7
Bahr	9	12	63	1
Barrett	18	27	273	3
Beaver	170	1,797	1,203	24
Bloomer-Breford	2,724	16,828	20,672	262
Eveleigh	42	43	457	5
Feltes	333	1,007	5,393	35
Hagen	34	141	209	4
Harrison	1	2	1	1
Kraft-Prusa	3,753	13,885	29,115	328
Lanterman	99	646	454	11
Raymond	645	8,420	4,080	64
Roesler	7	13	37	1
Silica	7,189	61,094	48,906	763
Wende and W.	126	708	742	12
Clark County:				
Morrison	2	143	12	2
Edwards County:				
Belpre	1	2	.....	P&A
Dickinson County:				
Bonaccord	8	11	89	3
Ellis County:				
Beeching	57	65	355	6
Bemis-Shutts	4,885	31,194	28,806	463
Blue Hill	123	855	645	17
Burnett	3,715	18,675	31,325	208
Glathart	2	4	6	1
Koblitz	87	394	556	9
Leiker	17	22	78	2
Riverview	204	220	2,280	14
Walters	383	2,852	2,648	37
Ellsworth County:				
Heiken & N.	22	88	612	5
Lorraine	280	9,416	1,584	74
Stoltenberg	2,031	12,787	17,213	198
Wilkins	787	3,995	7,005	71
Finney County:				
Nunn	78	252	548	5
Graham County:				
Morel	912	1,978	7,022	55
Harvey County:				
Halstead	62	1,528	472	19
Hollow-Nikkell	246	19,680	1,820	61
Sperling	34	6,362	238	5
Kearney County:				
Patterson	33	116	204	3
Kingman County:				
Cunningham	682	4,817	6,183	116
McPherson County:				
Bornholdt	1,506	7,638	8,862	148
Crowther	297	494	1,506	19
Graber	355	7,900	2,100	132
Henne	273	695	1,305	21

then he said to himself

"You're in it for life!"



To those who look at postwar simply as a date on the calendar, the words of Charles F. Kettering, Vice-President, General Motors, add *duration* to that date. Says he:

> "We ought to pay more attention to the future. We ought to pay more attention to it than we do to the past, because every one of us is going to spend the rest of his life in it."

What sort of a life that may be is governed largely by what a man does for his product

> . . . for it is "Boss" Kettering's contention that he is *not* boss . . . that the machine he is working with is *always the boss*. If he is not doing the right thing for the machine, the machine will not do the right thing for him.

Practicing that philosophy, many men are making products that will assure a successful future.

KANSAS (Continued)
(In thousands of barrels)

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Johnson	103	2,910	590	15
Lindsborg	943	2,120	7,880	100
Paden	132	135	865	16
Ritz-Canton	864	37,875	6,125	219
Roxbury and S.	392	1,865	2,635	41
Voshell	630	25,334	4,666	87
Welch and E.	85	4,594	606	24
Ness County:				
Aldrich	135	788	1,012	16
Pawnee County:				
Pawnee Rock	253	1,231	1,569	25
Norton County:				
Hewitt	7	27	33	1
Phillips County:				
Dayton and N.	193	568	1,632	28
Hansen	93	121	979	11
Ray	1,172	3,256	8,744	76
Pratt County:				
Carmi	2,067	2,605	17,395	91
Chitwood	513	525	5,875	32
Frisbie	37	56	214	3
Iuka	219	1,069	1,131	24
Stark	235	316	2,284	13
Reno County:				
Burrton	1,525	38,438	9,562	375
Hilger and N.	335	3,099	2,901	44
Peace Creek	1,638	6,275	14,725	130
Rice County:				
Chase	3,702	37,356	19,644	394
Edwards	1,001	6,043	5,957	88
Geneseo	2,267	14,862	14,638	195
Hafferman	83	748	502	10
Orth and W.	139	1,172	828	21
Smyers	218	623	1,677	23
Wherry	337	9,284	1,716	120
Rooks County:				
Laton	287	2,423	1,577	90
Westhusin	108	776	724	15
Russell County:				
Atherton	159	1,600	1,200	35
Big Creek	476	4,404	4,096	81
Fairport	805	17,070	4,430	145
Graham	2,286	27,005	17,995	304
Hall-Gurney	3,750	22,714	27,286	539
Russell and N.	369	6,002	3,498	54
Strecker	10	15	65	2
Trapp-Sellens	9,347	57,422	72,578	931
Vaughn	335	1,500	1,700	37
Williamson	400	633	3,617	44
Rush County:				
Albert	130	1,098	902	17
Otis	287	2,520	2,480	25
Saline County:				
Hunter	165	228	1,272	17
Pliny	3	7	8	1
Salina	9	16	109	2
Scott County:				
Shallow Water	79	1,506	694	9
Sedgwick County:				
Eastboro	109	8,448	812	31
Goodrich	248	3,718	1,782	30
Greenwich	180	9,896	1,404	41
Robbins	66	3,480	520	49
Valley Center	220	21,040	1,960	59
Sheridan County:				
Studley	92	122	1,078	6
Stafford County:				
Bedford	142	847	1,253	21
Byram	5	7	33	1
Drach	516	1,245	2,255	42
Farmington	153	177	1,323	12
Fischer	39	213	237	3
Gates	144	1,091	909	13
Grunder	4	8	22	1
Heyen	28	28	272	3
Jordan	58	486	314	7
Kipp	83	409	416	11
Leesburg	300	1,314	1,886	16
Max	136	435	1,065	12
Richardson	687	6,469	5,531	60
Shaeffer	35	212	388	6
Sittner	104	2,243	757	20
Snider	103	674	1,076	10
Spangenburg	12	21	99	1
St John	204	1,750	1,750	25
Stafford	355	1,461	2,739	21
Van Lieu	53	94	506	3
Zenith	3,624	17,768	32,232	373
Sumner County:				
Churchill	92	18,825	1,175	58
Oxford	186	15,577	1,423	46
Padgett	63	2,139	561	20
Wellington	193	5,457	1,443	96
Trego County:				
Wakeeney	43	556	344	6
Misc. Western Kansas	4,113	22,170	27,500	688
Subtotal W. Kansas	84,078	740,599	619,665	9,700
Eastern Kansas	15,779	730,589	131,608	16,550
Grand total Kansas	99,857	1,471,188	751,273	26,250

PRODUCTION AND RESERVES—ILLINOIS

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Allendale	605	1,883	6,465	135
Benton and North	1,655	16,564	8,680	251
Bible Grove and S.	985	2,042	6,815	118
Boyleston Consolidated	1,020	4,504	2,920	165
Bridgeport, Old and New	1,932	233,895	19,000	3,256
Casey	383	54,215	4,900	2,373
Centralia and West	1,785	26,016	16,100	2,388
Clay City Consol. and West	4,890	36,303	16,900	915
Dale-Hoodville	3,160	19,268	15,800	413
Dix	510	4,050	6,120	84
Dundas Consolidated	780	11,186	3,900	268
Inman, and E., N., W.	1,005	2,959	3,200	125
Iola	1,085	2,106	4,000	108
Johnsonville, N., S., W.	1,460	14,344	6,250	250
Keensburg Consol.	873	9,781	3,060	320
Louden	11,175	112,511	52,880	1,951
Mount Carmel and W.	1,330	4,950	3,470	325
Mount Erie, N. and S.	1,332	1,689	3,640	41
New Harmony Consol. and S.	4,395	28,462	21,980	713
Noble-Schnell	2,165	20,773	27,405	345
Patoka and East	940	5,890	5,100	172
Phillipstown Consol.	985	2,449	2,800	139
Robinson	1,078	151,063	9,710	4,767
Roland	760	4,847	2,280	153
Rural Hill	925	7,977	4,850	200
Salem	8,310	185,551	32,960	2,379
Sims and North	965	4,178	3,800	93
St. James	930	7,713	4,630	173
Walpole	705	2,516	2,800	70
Woodlawn	960	7,937	2,400	154
Miscellaneous	16,739	99,047	65,932	1,015
Total Illinois	76,987	1,086,669	361,747	23,869

PRODUCTION AND RESERVES—MICHIGAN

	1944 production	January 1, 1945 Cumulative	January 1, 1945 Estimated reserves	January 1, 1945 No. of wells
Adams-Arenac	1,155	4,725	7,275	63
Allegan County	630	11,446	2,520	443
Beaverton-Grout	102	1,235	815	37
Bentley	93	911	860	43
Buckeye, N. and S.	410	19,329	4,100	230
Cedar	160	300	1,490	9
Clayton-Arenac	170	4,005	1,870	44
Deep River	570	570	2,430	13
Essexville	105	105	1,995	7
Evart	730	1,933	2,190	28
Fork-Mecosta	1,420	2,239	5,760	50
Freeman-Redding	400	13,942	1,600	103
Goodwell-Newaygo	377	626	1,500	30
Greendale-Chippewa	305	22,515	4,270	169
Hatton	55	55	100	2
Headquarters	1,240	5,938	3,200	38
Kawkalin	742	2,157	4,745	121
Norwich	160	160	1,840	19
Ogemaw County	270	270	2,700	222
Ottawa County	62	62	620	12
Porter-Yost	865	41,291	5,190	318
Prosper	235	513	1,175	12
Reed City	5,150	25,008	21,010	183
Richfield	92	245	565	15
Rose Lake	444	444	3,550	13
Sherman	95	4,281	380	49
Van Buren—all pools	550	10,594	3,300	218
Vernon-Leaton-Denver	145	7,695	1,305	64
Walker-Wyo-Talmadge	403	9,915	1,610	463
Winterfield-Clare	380	3,444	950	38
Wise-Isabella	164	2,070	1,800	64
Woodville-Newaygo	54	112	540	7
Miscellaneous	426	18,788	2,780	244
Total Michigan	18,159	216,923	96,035	3,371

Location, Depth and Initial Production of Discovery Wells

Much of the 1945 drilling program will be focused on newly discovered pools and projected to the new pays proven productive in 1944. Locations, producing depths and initial output of 1944 discoveries presented on the next several pages, consequently, show significant facts upon which this year's exploration and development operations will be based. These data supplement the information on newly developed reserves tabulated on pages 185 to 192, inclusive.

CALIFORNIA

ANTELOPE PLAINS — Kern County, June, Shell Oil Co., Inc., 57-X-31 Hopkins fee, 31-27s-20e, Hopkins sand, Eocene age, 2,485-97 ft. and 2,500-15 ft., IP 51 bbl. Most southerly Eocene age production on west side of San Joaquin Valley.

ANT HILL—Kern County, July, Upper zone, Amerada Petroleum Corp., 36-15 Southern Pacific, 15-29s-29e, Olcese sand, Miocene age, 2,170-2,225 ft., IP 70 bbl. Lower zone, November, Amerada, 8-15 Southern Pacific, 15-29s-29e, Jewett sand, Miocene age, 3,670-80 ft. and 3,690-3,700 ft., IP 182 bbl.

BAKERSFIELD SEWER FARM — Kern County, November, Western Gulf Oil Co. 1 Cohn Estate, 3-20s-28e, Wicker sand, Miocene age, 2,785-5,805 ft., IP 55 bbl.

BELLEVUE—Kern County, May, Superior Oil Co., 36-35 Houghton, 35-29s-26e, Stevens sand, Miocene age, 6,570-6,675 ft., IP 1,900 bbl.

BLACKWELLS CORNER—Kern County, January, Etienne Lang 30 Occidental, 30-26s-19e, Santos, lower Miocene, 1,236-1,355 ft., IP 100 bbl.

GOSFORD—Kern County, August, Tide Water Associated Oil Co. 44-22 Kern County Land, 22-30s-26e, Stevens sand, Miocene age, 8,060-8,152 ft., IP 30 bbl.

JACALITOS, NORTHWEST — Fresno County, Tide Water Associated Oil Co. 27-16 Jacalitos, 16-21s-15e, Temblor formation, Miocene age, 3,806-26 ft. and 3,846-60 ft., IP 1,140 bbl.

MOUNTAIN VIEW, NORTH — Kern County, May, Tide Water Associated Oil Co. 24-18 Porter, 18-30s-29e, Wharton sand, Miocene age, 4-380-4,451 ft., IP 500 bbl.

MOUNT POSO, EAST — Kern County, May, H. H. Magee 2-11 Glide, 11-27s-28e, Vedder sand, Miocene age, 1,280-1,300 ft., IP 25 bbl.

MOUNT POSO, NORTHWEST — Kern County, February, D. G. Vedder 3-18 Vedder, 18-27s-28e, Vedder sand, Miocene age, 2,410-62 ft., IP 126 bbl. First well completed in this field November 1943 was a gas well, no oil.

PREMIER, EAST—Kern County, June, Independent Exploration Co. 3 Conoco, 33-27s-27e, Etchegoin sand, Pliocene age, 2,260-2,352 ft., IP 147 bbl.

RACE TRACK—Kern County, September, British-American Oil Co. 53-3 Portals, 3-30s-29e, Jewett sand, Miocene age, 4,736-66 ft., IP 78 bbl.

SAN MARTINEZ, WEST—Los Angeles County, May, Standard Oil Co. of California 3-1 Newhall Land & Farming, 19-4n-17w, Newhall sand, Pliocene age, 5,020-5,345 ft., IP 48 bbl.

SHEEP SPRINGS—Kern County, September, Rothschild-Bender 2 Sheep Springs, 17-29s-21e, Carneros sand, Miocene age, 3,450-87 ft., IP 275 bbl.

WHITTIER HEIGHTS — Los Angeles County, Capital Co. 2-1 Baldwin, 11-2s-11w, Turnbull sand, Miocene age, 1,100-1,285 ft., IP 40 bbl.

ALISO CANYON—Los Angeles County, November, Standard Oil Co. of California 1-4 Sesnon, 28-3n-16w, Sesnon sand, Eocene age, 9,075-9,170 ft., IP 392 bbl. Eocene sand found in previous well but not produced. This is first actual sustained Eocene production. All previous production from sands of Miocene age.

Barnsdall Oil Co. and Bandini 1 Roosa, 29-3n-16w, Roosa sand, Pliocene age, 5,600-5,827 ft., IP 63 bbl. Fault trap west of field. Future importance questionable.

ARROYO GRANDE — San Luis Obispo County, May, W. C. McDuffie 1 Dollie, 5-32s-13w, Pismo formation, Pliocene age, 2,200-90 ft., IP 156 bbl.

BUENA VISTA HILLS — Kern County, March, Standard Oil Co. of California 54-27-B fee, 27-31s-23e, new productive oil sand designated as 27-B zone, Pliocene age, 4,360-4,438 ft., IP 624 bbl.

LANARE — Fresno County, February, Amerada Petroleum Corp. 65-15 California Lands, 15-17s-18e, Helm sand, Eocene, 8,018-60 ft., IP 105 bbl.

MONTEBELLO — Los Angeles County, November, Union Oil Co. 3 Howard & Smith, 2-2s-12w, H. & S. sand, Miocene, 8,660-85 ft. Bottom of hole 10,722 ft., IP 648 bbl.

POTRERO—Los Angeles County, March, Basin Oil Co. 14 Potrero, 34-2s-14w, Potrero sand, Miocene age, 8,850-9,000 ft., IP 183 bbl.

SAN MIGUELITO — Ventura County, April, Continental Oil Co. 31 Grubb, 24-3n-24w, Sesond Grubb sand, Pliocene age, 7,160-7,706 ft., IP 1,558 bbl.

MONTANA

CLARK'S FORK—Carbon County, December, General Petroleum Corp. 1 Government, C NW NW 25-9s-22e, second Frontier sand 6,450-6,525 ft., IP 200 bbl.

DRY CREEK—Carbon County, November, Ohio Oil Co. 18 Northern Pacific, NE NE SW 3-7s-21e, Morrison sand 3,905-45 ft., IP 300 bbl.

FARMINGTON—Teton County, August, Union Oil Co. of California 1 Greene, SW SW 28-35n-3w, Ellis-Madison contact 1,737-46 ft., IP 10 bbl. oil, 10 bbl. water.

WILLSHAW BLOCK — Toole County, June, Texas Co. 1 Wagner, NE SW NE 20-36n-1w, Sunburst sand 1,737-78 ft., IP 12 bbl.

WYOMING

BAILEY — Carbon County, December, Sinclair-Wyoming Oil Co. 1 Coffman, SE NE NE 21-26n-89w, Sundance sand 5,098-5,206 ft., on drill-stem test at 5,160-5,206 ft. filled at rate of 35 bbl. per hour, well not completed at end of year.

BIG SAND DRAW — Fremont County, November, Sinclair-Wyoming Oil Co. 1 Unit, SW NW NW 14-32n-95w, Embar sand 6,896-6930 ft., drill-stem test at 6,896-6,913 ft. 1,560 ft. oil, 633 ft. oil-cut mud and 90,000 cu. ft. of gas, DST at 6,913-30 ft., distillate with indicated gas potential of 15,000,000 cu. ft., no production test, drilled to Tensleep.

December, Sinclair-Wyoming Oil Co. 1 Unit, SW NW NW 14-32n-95w, Tensleep sand 7,285-7,588 ft., IP (est.) 1,000 bbl.

COOPER COVE—Carbon County, May, Stanolind Oil & Gas Co. 1 Hohnson-Parkinson, SE NE SW 20-18n-17w, Dakota sand 4,834-4,912 ft., IP 286 bbl.

CROOK'S GAP—Fremont County, November, Sinclair-Wyoming Oil Co. 1 State, NW SW NW 18-28n-92w, Lakota sand 5,225-75 ft., IP 1,478 bbl.

GEBO—Hot Springs County, September, Continental Oil Co. 3 Gebo Unit, SW SE NW 23-44n-95w, Tensleep sand 4,887-5,103 ft., IP 1,309 bbl.

GOLDEN EAGLE—Hot Springs County, June, Pioneer Oil Corp. 1 Unit 1, C NE SW 12-45n-97w, Muddy sand 6,724-70 ft., IP 500 bbl., through choke.

HALF MOON—Park County, October, Husky Refining Co. 1 Krampert Unit, NE SW NW 23-51n-102w, Embar sand 3,365-3,455 ft., IP 840 bbl.

KIRBY CREEK — Hot Springs County.

November, Pacific Western Oil Corp. 1 Government, SE NE NE 21-43n-92w, Embar sand 3,418-93 ft., IP 150 bbl.

LITTLE BUCK CREEK—Niobrara County, July, Continental Oil Co. 1 Wright, NW SW NW 25-36n-64w, Dakota sand 3,816-67 ft., IP 552 bbl.

LITTLE BUFFALO BASIN—Park County, February, Fred Goodstein 1 Pedley-Government, NE NE NW 13-47n-100w, Tensleep sand 4,780-4,965 ft., IP 135 bbl.

MUSH CREEK—Weston County, February, Western Oil Trust No. 1, C NW SE 24-44n-63w, Muddy sand 3,852-55 ft., IP 80 bbl.

NORTH BIG HOLLOW—Albany County, October, Oklahoma Oil Co. 1 Union Pacific-Fuller, C NE NW 7-15n-75w, Muddy sand 827-848 ft., IP 100 bbl.

SPINDLETOP—Natrona County, August, Wyalta Oil Co. 1-D Government, SE SE SW 32-30n-81w, Tensleep sand 2,224-2,445 ft., IP 640 bbl.

STEAMBOAT BUTTE—Fremont County, April, British American Oil Producing Co. 2-C Tribal, NE NE SE 31-4n-1w, Tensleep sand 6,771-7,034 ft., IP 570 bbl.

December, British American Oil Producing Co. 4-E Tribal, NE SE NW 5-3n-1w, Lakota sand 4,495-4,544 ft., IP 450 bbl.

WAGONHOUND—Hot Springs County, June, Broderick & Gordon 1 Christensen, CNL NE SE 6-44n-98w, Embar sand 4,253-4,330 ft., IP 250 bbl.

WINKELMAN—Fremont County, March, Stanolind Oil & Gas Co. 1 Shoshone-Arapaho, SW SE SW 18-2n-1w, Tensleep sand 2,887-2,913 ft., IP 480 bbl.

COLORADO

CLARK'S LAKE—Larimer County, March, Amerada Petroleum Corp. 1 Hartshorn, SE NE SW 15-9n-68w, Muddy sand 5,888-5,970 ft., IP 177 bbl.

NORTH FORT COLLINS—Larimer County, December, Trigood Oil Co. 1 Community, C SE NE 18-8n-68w, Muddy sand 4,725-50 ft., IP 75 bbl.

WEST TEXAS

BARNSLEY—Crane County, February, John I. Moore et al 1 T. C. Barnsley, NE NE Section 42, Block 32, 2½ miles east of Sand Hills pool, Clear Fork 4,500-4,651 ft., IP 189 bbl.

CHIPLEY—Cochran County, August, San Andres Production Co. 1 Clouser, center NE Labor 18, League 62, Midland County School Land, San Andres lime 4,860-75 ft., IP 187 bbl.

CROSSETT—Crane-Upton counties, August, The Texas Co. 1-A Hobbs-Shell, N¼ N¼ Section 46, Block 35, H&TC Survey, Devonian lime 5,300-90 ft., IP 435 bbl.

EMMA HOLT—Andrews County, October, The Texas Co. 1-L Magnolia-University, NE SW Section 41, Block 9, University Land, Holt lime 5,310-30 ft., IP 541 bbl.

EUBANK—Gaines County, November, Humble Oil & Refining Co. 1 Doss, SW SW Section 9, Block A-24, PSL, lower Clear Fork lime 7,030-80 ft., IP 210 bbl.

FORT STOCKTON—Pecos County, August, Humble Oil & Refining Co. 1 O. W. Williams, NW NE Section 3, Block 114, GC&SF Survey, Yates sand 2,840-80 ft., IP 22 bbl.

LION—Ward County, October, Lion Oil Refining Co. 1-B University, NE NE Section 43, Block 18, University Lands, Delaware lime-sand 4,979-94 ft., IP 122 bbl.

MABEE—Andrews County, January, The Texas Co. 1 J. E. Mabee, SE NW Section 37, Block 40, G&MMB&A Survey, Grayburg 4,640-4,702 ft., IP 313 bbl.

MIDLAND FARMS—Andrews County, June, Stanolind Oil & Gas Co. 1-F Midland Farms, SE NW 1-42-2n, G&MMB&A Survey, San Andres lime 4,820-80 ft., IP 548 bbl.

NORTH MONAHANS—Winkler County, March, Stanolind Oil & Gas Co. 1 Sealy-Smith Foundation, SW SW Section 50, Block A, G&MMB&A Survey, Clear Fork (Tubb) lime 6,170-6,248 ft., IP 298 bbl.

MORITA—Howard County, January, Northern Ordnance, Inc. 1 J. W. Cook, SE NW 23-34-1n, T&P Survey, San Andres lime 3,193-3,290 ft., IP 13 bbl.

PATILLOS—Andrews County, May, The Texas Co. 1 A. W. Patillos, SW SW Section 22, Block A-36, PSL, Grayburg-San Andres 4,280-4,380 ft., IP 72 bbl.

P-H-D—Garza County, August, Honolulu Oil Corp.-Devonian Oil Co. 1 Dayton, SW SE Section 1421. A. 347, TTRC Survey, San Andres lime 3,544-65 ft., IP 131 bbl.

SMYER—Hockley County, January, Woodley Petroleum Co. 1 Harless-Stanolind, NW NW Section 21, Block A, R. M. Thompson Survey, Clear Fork lime 5,917-80 ft., IP 161 bbl.

WHITEFACE—Cochran County, March, E. Constantin, Jr. 1 G. W. Moore, SW SW Labor 9, League 64, Midland County School Land, San Andres lime 4,755-4,910 ft., IP 253 bbl.

YELLOWHOUSE—Hockley County, April, Stanolind Oil & Gas Co. 1 Cobb, SE SE Labor 103, League 75, Haskell County School Land, San Andres lime 4,596-4,663 ft., IP 61 bbl.

UNNAMED—Andrews County, May, Signal Oil & Gas Co. 1 Fisher, SW SW, Section 25, Block A-35, PSL, San Andres lime 4,456-4,560 ft., IP 19 bbl.

UNNAMED—Cochran County, July, Helmerich & Payne, Inc. 1 D. S. Wright, SE SE Labor 19, League 97, Brewster County School Land, Survey, San Andres lime 4,901-21 ft., IP 369 bbl.

UNNAMED—Ector County, December, Shell Oil Co., Inc., and Cities Service Oil Co. 1 Texas Pacific Land Trust (TXL), SE SE 7-45-1s, T&P Survey, Devonian lime 7,886-8,020 ft., IP 1,911 bbl.

UNNAMED—Pecos County, May, Debs Patillo 1 Iowa Realty Trust, E¼ N¼ W¼ Section 61, Block 10, H&GN Survey, Seven Rivers 1,300-56 ft., IP 24 bbl.

UNNAMED—Reagan County, June, Superior Oil Corp. of California et al 1 University, SW NW Section 25, Block 8, University Land, Grayburg lime 3,135-75 ft., IP 61 bbl.

NEW PAYS

FULLERTON—Andrews County, December, Magnolia Petroleum Co. 3-11 Ralph, 810 ft. from south and east lines Section 11, Block A-37, PSL, Yates sand 3,050-3,150 ft., IP 28 bbl.

FULLERTON—Andrews County, December, Mid-Continent Petroleum Corp. 1-7 University, SW SE Section 20, Block 13, University Lands, Devonian lime 8,460-8,600 ft., IP 3,744 bbl.

SAND HILLS—Crane County, April, Gulf Oil Corp. 43-E Waddell, NW SE Section 20, Block B-26, PSL, Ellenburger 5,800-35 ft., IP 1,275 bbl.

SAND HILLS—Crane County, February, Gulf Oil Corp. 45 Waddell, SW SW Section 27, Block B-26, PSL, McKnight lime 3,150-3,230 ft., IP 11,741 bbl.

TODD DEEP—Crockett County, August, Amerada Petroleum Corp. 5-A Todd, SW NE Section 25, Block WX, GC&SF Survey, Ellenburger 6,130-6,210 ft., IP 535 bbl. (Note: Two wells tested this pay but both plugged back to complete in field's regular Crinoidal lime pay, no wells yet on production from Ellenburger zone).

VINCENT—Howard County, April, W. S. Guthrie and Cosden Petroleum Corp. 2 Allen, NW SE Section 57, Block 20, L&N Survey, lower Clear Fork 5,451-5,502 ft., IP 36 bbl.

SOUTHEASTERN NEW MEXICO

DRINKARD—Lea County, October, Gulf Oil Corp. 1 Vivian-Drinkard, NE NW 30-22-38, 2½ miles east of Penrose field; Clear Fork lime 6,375-6,460 ft., IP 1,314 bbl.

DUBLIN—Lea County, December, Humble Oil & Refining Co. 1 Federal permit-Leonard Oil Co., SE SW 12-26-37, Ellenburger lime 11,870-11,928 ft., IP 203 bbl. 5/32-in. choke (official completion gage not reported at end of year, may rework).

TONTO—Lea County, June, The Texas Co. 1 W. H. Baskin, SE SE 22-19-33, Permian lime reef, 3,565-86 ft., IP 290 bbl.

UNNAMED—Eddy County, July, P. B. English 1 Hinkle, NE NE 22-19-31, Yates sand 2,370-2,435 ft., IP 15 bbl.

UNNAMED—Eddy County, December, Martin Yates, Jr. et al 1 Kaiser, NE NW NW 29-18-27, Permian sand 1,395-1,483 ft., IP 8 bbl.

UNNAMED—Lea County, December, Continental Oil Co. 2-B-23 Skaggs, SW NW 23-20-37, Wolfcamp (basal Permian) or Devonian lime 7,700-25 ft., IP 270 bbl.

TURNER AREA—South Lovington field, Lea County, June, Fred Turner, Jr. 1-B State, SE SW 4-17-36, 2¼ miles west production, San Andres lime 4,765-5,150 ft., IP 350 bbl.

NORTH AND WEST CENTRAL TEXAS

ATKINS—Stephens County, August, Sinclair Prairie Oil Co. 16-A Atkins, SW SE Section 19, Block 2, SPR Survey, Mississippian lime 4,245-90 ft., IP 1,345 bbl.

BUFFALO SPRINGS—Clay County, September, Continental Oil Co. and Edge Oil Co. 1 W. D. Crockett, NE NE Section 3,245, TE&L Survey, Simpson (Ordovician) 6,490-6,513 ft., IP 165 bbl.

CHILLICOTHE—Hardeman County, May, Humble Oil & Refining Co. 1 O. H. Dodson, SE NE Section 49, Block 10, H&TC Survey, Strawn lime 4,248-55 ft., IP 19 bbl.

EWALT—Throckmorton County, September, Panhandle Refining Co. and Anderson-Prichard Oil Corp. 1 W. B. Ewalt, Section 2,170, TE&L Survey, Bend lime 4,156-61 ft., IP 744 bbl.

FARMER—Young County, July, Sohio Petroleum Co. 1 J. R. Garvey, 330 ft. from south, 990 ft. from east lines, Section 1,856, TE&L Survey, Bend lime 4,463-85 ft., IP 805 bbl.

GARRETT—Archer County, June, Consolidated Oil Co. and Premier Oil Refining Co. 1 Mrs. B. Garrett, center east 20 acres, J. Walker Survey A-676, Strawn sand 3,780-3,800 ft., IP 112 bbl.

GATEWOOD—Cooke County, October, S. D. Johnson 1 J. S. Gatewood, southeast corner 215-acre tract, MEP&PRR Survey, Strawn sand 1,568-81 ft., IP 157 bbl.

HUNDLEY—Montague County, July, Continental Oil Co. and Sinclair Prairie Oil Co. 1 J. M. Hundley, D. Martindale Survey A-465, Bend conglomerate 6,228-35 ft., IP 800 bbl.

LESTER—Jack County, March, Shell Oil Co., Inc. 1-A O. J. Lester, southwest corner McKinney & Williams Survey A-435, Mississippi lime 5,458-5,512 ft., IP 1,968 bbl.

MADDEN—Wichita County, May, Panhandle Refining Co. 1 E. B. Madden, NE NE Block 8, J. A. Kemp subdivision, W. Mayer Survey A-193, Strawn lime 4,280-4,305 ft., IP 31 bbl.

MADDEN—Wichita County, November, James Stewart & Co. 3 E. B. Madden, Block 8, Wm. Mayer Survey, Bend lime 5,072-92 ft., IP 1,440 bbl.

McNUTT—Montague County, October, Continental Oil Co. 1 J. R. McNutt, SE SE Section 38, ET Ry. Co.-Burnett-McNutt Survey, Viola lime 6,715-30 ft., IP 266 bbl.

ODELL — Wilbarger County, October, Fain-McGaha Oil Corp. 1 G. K. Martin, SE NW Section 5, Block 11, H&TC Survey, Palo Pinto lime 4,747-4,806 ft., IP 254 bbl.

ROSS, W. — Clay County, November, Fain-McGaha Oil Corp. and Drilling & Exploration Co. 1 O. A. Ross, SE NE Section 7, BBB&C Survey, Bend lime 5,395-5,435 ft., IP 822 bbl.

SCALING—Clay County, April, H. F. Wilcox Oil & Gas Co., Continental Oil Co. and Skelly Oil Co. 1 G. W. Scaling, NE NE J. Gamble Survey A-168, Bend lime 5,554-70 ft., IP 965 bbl.

SIVELS BEND—Cooke County, November, The Texas Co. 1 W. B. Rasure, NE corner 224-acre tract in Jno. Massingill Survey A-687, Strawn sand 6,755-63 ft., IP 139 bbl.

WEAVER—Jones County, July, Merry Bros. & Perini and Alder Oil Co. 1 Ida L. Weaver, SE SE SE Section 6, Block 17, T&P Survey, Cook sand 2,461-65 ft., IP 75 bbl.

WILLIAMS—Coleman County, March, Hunter & Hunter and Sohio Petroleum Co. 1-B Williams, SW NE SW Section 18, Block 2, T&NO Survey, Gray sand 3,768-99 ft., IP 880 bbl.

WOODBINE—Cooke County, February, Northern Ordnance, Inc. 1 Foy Davis, 330 ft. from east, 330 ft. SE of MKT and G. De Los Santos Coy Survey A-894, Strawn sand 4,350-57 ft., IP 110 bbl.

UNNAMED—Archer County, May, D. H. Bolin 1-B-23 Abercrombie, Block 23, J. W. Harris Club Ranch subdivision, Cisco sand 1,492-1,501 ft., IP 8 bbl.

UNNAMED — Archer County, October, A. P. Kouri 1 Keys, J. M. Swisher Survey A-396, Gunsight 1,114-19 ft., IP 8 bbl.

UNNAMED—Archer County, February, Martin Properties, Inc. 1 John Purcell, Jose Ostane Survey A-333, Cisco sand 1,150-54 ft., IP 68 bbl.

UNNAMED — Archer County, October, White & Duncan 1-C Richardson, Block 10, J. Scott Survey A-374, Cisco sand 1,216-20 ft., IP 9 bbl.

UNNAMED—Clay County, May, Bridwell Oil Co. 2 Bridwell River Ranch, SW SW Block 27, Word & Houssels subdivision, Strawn sand 4,745-70 ft., IP 386 bbl.

UNNAMED—Clay County, May, Roger Lacy and L. S. Flannery 1 Lyles, Block 21, San Augustine University Survey, Bend lime 5,860-70 ft., IP 95 bbl.

UNNAMED — Coleman County, March, Franchot, Ball & Hanson 1 Michie, SE NE J. L. Luckenbach Survey 258, A-470, Ranger lime 3,313-25 ft., IP 14 bbl.

UNNAMED—Coleman County, December, States Oil Corp. 1 Burroughs, SE SW SE Section 3, Block 1, HT&B Survey, Strawn sand 2,820-52 ft. (Morris sand), IP 37 bbl.

UNNAMED—Cooke County, September, Kadane-Griffith Oil Co. 1 Hopkins, NW NW Section 18, BBB&C Survey A-150, Bend conglomerate 2,973-82 ft., IP 846 bbl.

UNNAMED — Cooke County, August, Paul B. Scott et al 1 Walterscheid, E. Langford Survey, Strawn sand 2,602-10 ft., IP 248 bbl.

UNNAMED — Jack County, November, Continental Oil Co. 1 Risch, SE SE Section 13, Block 2, Bend lime 4,380-4,420 ft., IP 392 bbl.

UNNAMED — Jack County, February, Panhandle Refining Co. 1 Kinder, NW NW NW Section 2,667, TE&L Survey, Strawn sand 1,850-58 ft., IP 25 bbl.

UNNAMED—Jones County, March, John W. Byram & Cardinal Oil Co. 1 Alexander, Section 3, Block 14, T&P Survey, Bluff Creek sand 1,607-58 ft., IP 80 bbl.

UNNAMED—Jones County, March, Eason Oil Co. and Jones & Stasney 1 Freeman, NE NE Henry Virm Survey 263, Gunsight lime 2,793-2,815 ft., IP 15 bbl.

UNNAMED — King County, December, Ohio Oil Co. 1 Ross, Section 24, R. B. Masterson Survey A-1,163, Strawn lime 5,233-57 ft., IP 1,832 bbl., estimated.

UNNAMED — Shackelford County, November, Fortex Oil Corp. 2 Smalley, Section 13, ET Survey, Block 10, Fry sand 631-635 ft., IP 12 bbl.

UNNAMED — Stephens County, June, Northern Ordnance, Inc. 1 Robertson, Section 1,142, TE&L Survey, Bend lime 3,222-36 ft., IP 101 bbl.

UNNAMED—Taylor County, November, Great Lakes Carbon Corp. 1 Jones, Wm. Bishop Survey 43, Flippen lime 2,005-34 ft., IP 50 bbl.

UNNAMED — Taylor County, October, The Texas Co. C-1 Henry Sayles, Lot 9, Sayles subdivision, League 122, W. R. Willis Survey, Flippen lime 2,268-84 ft., IP 51 bbl.

UNNAMED — Throckmorton County, March, Grisham-Hunter Corp. 2-D Kelley, NW section 2, Jas. Bell Survey A-1, 381, Cisco sand 811-819 ft., IP 128 bbl.

UNNAMED — Wichita County, June, Akin, Dimock, Sloan & Zook 2 Krohn, Block 289, Waggoner Colony Lands, Cisco sand 1,680-81 ft., IP 35 bbl.

UNNAMED — Young County, February, A. G. Bedner et al 1 Finley, Section 6, Poitevent-Everett Survey A-2,074, Bend lime 3,940-4,050 ft., IP 35 bbl.

UNNAMED—Young County, June, Burke Royalty Co. 1 Stovall, NW NW Section 495, TE&L Survey, Marble Falls sand 4,354-71 ft., IP 355 bbl.

UNNAMED—Young County, July, Kerlyn Oil Co. and Phillips Petroleum Co. 1 Clarida, W. A. Nicholson Survey A-1,697, Mississippian lime 5,263-70 ft., IP 816 bbl.

UNNAMED—Young County, April, Kerlyn Oil Co. and Phillips Petroleum Co. 1 Cope, SW SW Section 1,475, TE&L Survey, Bend lime 4,385-4,428 ft., IP 615 bbl.

UNNAMED—Young County, June Northern Ordnance, Inc. 1 McBrayer Bros., SW SE Section 1,907, TE&L Survey, Bend lime 4,334-50 ft., IP 20 bbl.

UNNAMED—Young County, July, Northern Ordnance, Inc. 2 F. H. Robertson, F. L. Green Survey A-105, Marble Falls sand 4,175-80 ft., IP 155 bbl.

UNNAMED — Young County, March, Standard Oil Co. of Texas and Hanlon-Buchanan, Inc. 1 R. T. Wells, Section 738, TE&L Survey, Strawn sand 3,574-79 ft., IP 7 bbl.

EAST TEXAS

CALVERT—Robertson County, November, Hamman O. & R. Co. 1 P. C. Gibson, 5½ miles west of Calvert, 1,700 ft. NE along SE line of 653-acre tract from SE corner of same, thence 1,000 ft. NW at right angles, Jesse Webb Survey, basal Navarro sand 2,180-94 ft., IP 70 bbl.

EYLAU—Bowie County, August, Barnsdall Oil Corp. and Sohio Oil Co. 2 Heilbron, 5½ miles southwest of Texarkana, 696 ft. from W, 670 ft. from S line 97.97-acre tract, M. H. Janes Survey, Smackover lime 7,710-16 ft., IP 155 bbl.

FRUITVALE—Van Zandt County, March, Superior Oil Co. of California 1 C. A. Groves, 4½ miles north of Canton, 330 ft. out of W corner E. Van Sickle Survey, Travis Peak sand 8,552-70 ft., IP 80 bbl.

MERIGALE—Wood County, December, Bobby Manziel 1 V. L. Evans, 800 ft. from W, 1,800 ft. from E line of J. Starks Survey, 2 miles east of Quitman, sub-Clarksville sand 4,860-4,905 ft., IP 32 bbl.

PICKTON—Hopkins County, November, Humble Oil & Refining Co. 1 C. D. Nichols, 2 miles south of Pickton, 1,500 ft. from N, 600 ft. from E line Isaac Friddle Survey, Bacon (Rodessa) lime 7,887-96 ft., IP 620 bbl.

SAND FLAT — Smith County, March, Skelly Oil Co. 1 W. C. Chisum, 550 ft. N and 1,400 ft. W of NW corner T. Hawkins but in Dan Minor Survey A-644, 2 miles southeast of Sand Flat, Paluxy sand 6,972-7,025 ft., IP 133 bbl.

SAND FLAT—Smith County, May, Sun Oil Co. 1 Patterson, 660 ft. from E, 610 ft. from S line 100-acre lease, F. Flores Survey, Rodessa lime 9,342-54 ft., IP 34 bbl.

SOUTH TYLER—Smith County, August, Phillips Petroleum Co. 1 McMinn, 660 ft. from N, 2,250 ft. from W line Mary M. Long Survey, Rodessa lime 9,918-29 ft., IP 281 bbl.

WINNSBORO — Wood County, March, Gulf Oil Corp. 1 Brewer, 610 ft. from W 1,200 ft. from S line Ben Lee Survey, 2 miles southwest of Winnsboro, Bacon (Rodessa) lime 7,990-8,014 ft., IP 231 bbl.

WINNSBORO—Wood County, September, Gulf Oil Corp. 1 Hornbuckle, 2,500 ft. NW discovery well, Ben Lee Survey, Gloyd (Rodessa) lime 8,210-40 ft., IP 72 bbl.

SOUTH TEXAS

BOEDEKER—Brooks County, June, Sun Oil Co. 3-A Boedeker-State, 16 mi. south of Falfurrias, R. Guzman Sur., IP 1,072,500 cu. ft. gas, shut-in gas well, through perforations 6,160-67 ft.

BOEDEKER—Brooks County, October, Sun Oil Co. 1-B G. Boedeker et al, Sur. 9, Blk. 1, IP 2,445,000 cu. ft. gas, through perforations 6,260-75 ft.

CHAPA RANCH—Live Oak County, January, Continental Oil Co. 1 Somerset Land & Cattle Co., 7 mi. northeast of Clegg, IP 34 bbl. condensate and 1,750,000 cu. ft. gas from Wilcox perforated 8,144-93 ft.

DAN SULLIVAN—Brooks County, August, Sun Oil Co. 1 D. J. Sullivan et al, 8½ mi. east of Falfurrias, A. Garcia grant, IP 147.66 bbl. through perforations 8,508-17 ft.

EAST ALTA MESA — Brooks County, November, Standard Oil Co. of Texas 4 Braulia G. de Garcia, 1½ mi. southeast of Alta Mesa field, IP 11,600,000 cu. ft. gas and estimated 250 bbl. condensate through perforations 7,387-7,400 ft. and 7,410-20 ft.

HERBST—Duval County, October, J. W. Gorman 2 A. Herbst (workover), 6 mi. east of Freer, IP, pumped 43.2 bbl. and 75 bbl. salt water, through perforations 2,833-34 ft.

JAKALAK—Starr County, July, T. E. Stephens 4 Hinojosa estate, 35 mi. northwest of Rio Grande City, shut-in gas well, dry gas, no gage, Oligocene sand perforated 1,920-42 ft.

LAS MUJERES—Jim Hogg County, May, Standard Oil Co. of Texas 1 E. G. Canales, approximately 7½ mi. northeast of Hebbronville, IP pump 18 bbl. from Pettus perforations 5,102-12 ft.

RETAMIA — Webb County, February, Phillips Petroleum Co. and Texas Gulf Producing Co. 1 A. M. Bruni estate, 9 mi. southeast of Pescadito, IP 2,250,000 cu. ft. gas and 25 bbl. condensate, from Carrizo-Wilcox perforations 4,960-72 ft.

ROSITA (Reyes)—Duval County, March, American Republics Co. 1 M. I. Richardson, 12 mi. northwest of San Diego, IP 162.24 bbl., from Pettus perforations 3,945-47 ft.

SAN CAJA — McMullen County, May, E. M. Jones 2-C H. Ezzell, 4 mi. southeast of Ezzell field, IP (dual completed) Carrizo-Wilcox, perforated 6,439-53 ft., flowed 52.91 bbl., and perforated 6,901-16 ft., flowed 127.17 bbl. condensate.

SOLIS—Starr County, February, Sun Oil Co. 1 S. Solis et al, 2 mi. southwest of Frost field, gas, slight spray condensate through perforations 4,072-80 ft.

SOUTH BRUNI — Webb County, July, Chas. E. Fraser, Inc., 1 A. M. Bruni estate, 6 mi. south of Bruni, gas well, perforations 1,810-12 ft.

SOUTH EAGLE HILL—Duval County, June, Harvey & Henderson 1 J. F. Welders heirs, 1½ mi. southeast of Eagle Hill, IP pumped 62.48 bbl. from Government Wells sand 2,067-76 ft.

NEW DISCOVERIES

UNNAMED — Duval County, October, Tom Graham 2 M. I. Richardson, 1½ mi. southeast of old Dinn field, 12 mi. northeast of Bruni, IP pumped 7 bbl. Jackson sand 1,784-93 ft.

UNNAMED — Duval County, Frank J. Gravis 1 Puig, 1 mi. east of North Sweden field, IP 2,500,000 cu. ft. gas from 4,009-21 ft.

NEW PAYS

AGUA PRIETA—Duval County, January, Taylor Refining Co. 1-B Valentin Sepulveda, BS&F Sur. 297, IP 120 bbl. through perforations 4,066-71 ft.

ARMSTRONG—Jim Hogg County, January, The Texas Co. 3 Royal R. Yaeger, R. Garza Sur. 222, IP 6,400,000 cu. ft. gas through perforations 2,878-81 ft.

EZZELL—McMullen County, April, E. M. Jones 104 Ezzell, Sec. 38, Sur. 180, IP pump 44 bbl. through perforations 1,200-06 ft.

GARCIA—Starr County, June, Sun Oil Co. 1 V. Garcia, Por. 94, IP 82.75 bbl. from 3,866-68 ft.

LOMA ALTA—McMullen County, June, Atlantic Refining Co. 1 J. W. Atkinson, IP 102 bbl. from Wilcox, 6,866-69 ft.

OAKVILLE-WILCOX—Live Oak County, September, H. Coquat 3 L. A. Reagan, 1 mi. south of Oakville, shut-in gas well, no gage, perforations 6,951-56½ ft.

SCOTT & HOPPER — Brooks County, March, Humble Oil & Refining Co. 3 Scott & Hopper, west of discovery well, IP 272 bbl. from 6,093-6,103 ft.

THOMAS-LOCKHART — Duval County, February, Pan American Production Co. 1-D Elizabeth Parr, Sur. 115, IP (dual completed) perforations 3,965-70 ft., 90 bbl., and perforations 3,271-87 ft., 9,500,000 cu. ft. dry gas, open flow.

SOUTH CENTRAL TEXAS

CHARLOTTE — Atascosa County, August, Humble Oil & Refining Co. 3 E. J. Pruitt et ux, 1 mile west of Charlotte, IP 176 bbl., ⅞-in. choke, Edwards lime 6,905-23 ft.

UNITED—Guadalupe County, May, United North & South Development Co. 1 Max Webb, 2 miles south of Luling in Benj. Fugua Survey, IP 213.36 bbl. through ⅞-in. choke, Del Rio topped 2,788 ft.

VAN CLEVE—Zavalla County, June, The Texas Co. 1 Wm. Van Cleve, 2 miles from west line of county, Shut-in gas well, RP 840 lb. Navarro perforated 1,960-66 ft.

UNNAMED—Milam County, November, C. Padger Reed 1 A. L. Lucas, 3 miles northeast of Rockdale, IP pumped 5 bbl. through perforations 1,365-82 ft.

LOWER GULF COAST TEXAS

ALBRECHT—Goliad County, September, Continental Oil Co. 1 Victoria Albrecht, 9 mi. northwest of Goliad, IP 75 bbl. from Wilcox, perforations 8,340-60 ft.

ALMOND—Jim Wells County, March, H. F. Wilcox Oil & Gas Co. 1-A Willie M. Almond, 2¾ mi. southwest of Alfred field. IP 1,150,000 cu. ft. gas through perforations 3,221-26 ft.

ANAQUA—Victoria County, December, Gulf Oil Corp. 1 Mary Simmons, Santiago Serna Survey, Shut-in gas well, perforations 5,350-58 ft.

BRAYTON—Nueces County, June, H. R. Smith and W. C. McBride 1 W. H. Rivers estate, 2 mi. northwest of Driscoll townsite. IP 131 bbl. from Frio perforations 7,197-7,205 ft.

BRAYTON—Nueces County, August, H. R. Smith and W. C. McBride 2 W. H. Rivers estate, Palo Alto Grant. IP 30,000,000 cu. ft. gas, 20 bbl. condensate per million, through perforations 6,592-6,638 ft.

BROWNLEE—Jim Wells County, February, Humble Oil & Refining Co. 1 E. M. Brownlee, 1½ mi. southwest of Alford. IP 32 bbl. from Vicksburg, perforations 4,940-50 ft.

CANALES—Jim Wells County, January, Sun Oil Co. 1 A. T. Canales, 4 miles southeast of La Gloria. IP 213.84 bbl. from Frio-Vicksburg, perforations 7,233-35½ ft.

COTTONWOOD CREEK—DeWitt County, April, Arkansas Fuel Oil Co. 1 W. F. Buehrig, 3 mi. northwest of Myersville. IP 52,-000,000 cu. ft. gas, Wilcox perforations 7,626-35 ft.

DOUGHERTY — Nueces County, May, Hewitt & Dougherty 1 Selma M. Mumme, 4 mi. west of San Patricio. IP 19 bbl. from Vicksburg perforations 5,469-71 ft.

EAST RIVERSIDE—Nueces County, March, Stanolind Oil & Gas Co. 3 Jennie A. Thompson, 4⅝ mi. northwest of Calallen. IP 154 bbl. through perforations 6,297-6,300 ft.

GREEN—Karnes County, May, Magnolia Petroleum Co. 1 Russell-Atkinson, Carlos Martinez Sur. IP 68 bbl. through perforations 6,537-43 ft.

GREGORY—San Patricio County, March, Humble Oil and Refining Co. 1 Joseph F. Green estate, 2 mi. southeast of Gregory. IP 270 bbl., Frio, perforations 9,120-40 ft.

KOONTZ—Victoria County, August, Lyons & Prentiss 1 Keeran estate, 17 miles south of Inez. IP 111 bbl., Vicksburg, perforations 4,754-58 ft.

LOS INDIOS—Hidalgo County, July, Baldridge & King, Nichols and Sohio Petroleum Co. 1 R. King, 4 mi. northwest of Linn. IP 3,911,000 cu. ft. gas through perforations 6,922-27 ft.

McCASKILL—Karnes County, November, Smith & McBride 1 W. C. McCaskill, Jr., Porter area. IP 18,000,000 cu. ft. gas, 108 bbl. distillate, through perforations 7,404-09 ft.

MISSION VALLEY — Victoria County, April, Northern Ordnance, Inc., 1 W. F. Heath, 1 mi. north of Mission Valley. IP 4,935,000 cu. ft. gas plus 123 bbl. condensate from Wilcox, perforations 8,402-07 ft.

NORTH GOLIAD (Fromme) — Goliad County, June, Ginther, Warren & Ginther 1 L. C. Fromme, 5½ mi. north of Goliad. IP 35,000,000 cu. ft. gas from Vicksburg, perforations 2,671-81 ft.

NORTH ODEM — San Patricio County, January, Texas Consolidated Oil Co. 1 W. C. Gaines, 2 mi. north of Odem. IP 91.2 bbl. from Frio, perforations 5,430-36 ft.

PLUMMER-WILCOX—Bee County, November, Magnolia Petroleum Co. 1 W. E. Erp, 9 mi. west of Pettus. IP 80.4 bbl. through perforations 7,974-78 ft.

POINT ISABEL—Cameron County, August, Great Lakes Carbon Co. 1-A Yturria Land & Livestock Co., 5 mi. southwest of Point Isabel. IP 6,000,000 cu. ft. gas, Miocene, perforations 5,980-83 ft.

PRIDHAM'S LAKE — Victoria County, July, Kingwood Oil Co. 1 Wilden, 2 mi. southwest of Victoria. IP 121 bbl. through perforations 4,770-74 ft.

RAY-WILCOX—Bee County, January, H. B. Zachry Co. 1 P. L. Campbell, 3 mi. east of Mineral. IP 14,000,000 cu. ft. gas plus 20 bbl. condensate per 1,000,000 cu. ft. gas, from Carrizo, 7,581-94 ft.

SEILER—Jim Wells County, April, Highland Oil Co. 1 Joe Seiler, 1½ mi. north of North Alice. IP 5,500,000 cu. ft. gas from lower Frio, perforations 4,960-72 ft.

SOUTH CABEZA CREEK—Goliad County, June, Continental Oil Co. 1 S. H. Reed, 2 mi. southeast of old shallow Pettus sand discovery at Cabeza Creek. IP 73 bbl. through perforations 8,806-16 ft.

SOUTH INEZ (North Keeran)—Victoria County, June, Edwin Neilson et al 1 J. Kounty, 76 mi. south of Inez. IP 12,500,000 cu. ft gas.

SOUTH WEESATCHE — Goliad County, April, Continental Oil Co. 1 G. Heard et al, 4 mi. southwest of Weser field. IP 27 bbl. from Wilcox, perforations 8,490-95 ft. and 8,500-05 ft.

SOUTHEAST TELFERNER — Victoria County, June, Geo. W. Strake 1 Tom O'Connor, Jr., et al, 2½ mi. northwest of town of Telferner. IP 35 bbl. from Oligocene sand, perforations 3,834-38 ft.

TIJERINA—Jim Wells County, March, The Texas Co. 2 H. C. de Tijerina, southeast of Seeligson field. IP 372 bbl. from Frio, perforations 7,117-25 ft.

TORO CREEK—Bee County, July, Dirks Brothers 1-A D. E. Robinson, 3 mi. west of Tuleta. IP 38 bbl., top of pay 3,884 ft.

WARMLEY—DeWitt County, February, Sohio Petroleum Co. 1 Yorktown National Bank, 4½ mi. southwest of Yorktown. IP 36 bbl. from Wilcox, perforations 7,085-90 ft.

WEESATCHE—Goliad County, May, Coffield, Frazier & Ranger 1 L. W. Chilton, 10 mi. northwest of Goliad. IP 47 bbl. from Wilcox, perforations 7,979-84 ft.

YOUGEEN — Bee County, March, W. Earl Rowe 1 Charles Peters, 6 mi. east of Clareville. IP 1,500,000 cu. ft. gas from Vicksburg, perforations 3,796-3,806 ft.

UNNAMED—Bee County, November, W. Earl Rowe et al 1 G. B. Davis, 4 mi. south of Beeville. IP 126,000,000 cu. ft. gas open flow, through perforations 3,773-81 ft.

UNNAMED—Goliad County, November, Amerada Petroleum Corp. 1 Ada C. McFadden, 5 mi. south of Charco. IP 85,000,-000 cu. ft. gas through perforations 8,932-42 ft.

UNNAMED—Jim Wells County, March, Smith & Mosser 1 E. H. Brieger (workover), 1½ mi. west of Orange Grove. IP 7,000,000 cu. ft. gas open flow, Miocene, perforations 2,120-32 ft.

NEW PAYS

AGUA DULCE—Nueces County, August, Ginther, Warren & Ginther 2 Mrs. Lena Grebe, Sec. 195, Palo Alto Grant. IP 152.88 bbl. through perforations 6,806-18 ft. Opened first oil production in Pfleuger sand.

BURNELL-WILCOX—Bee County, February, Magnolia Petroleum Co. 1 Elizabeth Ingram, James Richardson Sur. IP 51,200,-000 cu. ft. gas through perforations 6,660-70 ft.

McFADDIN—Victoria County, February, Barnsdall Oil Co. 13 Marberry, south flank. IP 140 bbl. through perforations 5,489-94 ft.

NORTH LUBY—Nueces County, February, Stanolind Oil & Gas Co. 2-A Gillette, Blk. 7, Roberts & White Subdivision. IP 115.39 bbl. through perforations 7,321-23 ft.

SAXET—Nueces County, June, The Chicago Corp. 1 Weil Bros., E. Villareal Sur. Estimated IP 38,000,000 cu. ft. gas open flow, through perforations 6,914-27 ft.

UPPER GULF COAST TEXAS

BEECH CREEK—Hardin County, April, American Republics Corp.-Houston Oil Co. of Texas 1 H.&T.C.-fee, in H&TC Sur., IP 273.43 bbl., from first Yegua-Cockfield, perforations 6,234-52 ft.

COLUMBUS—Colorado County, March, Cities Service Oil Co. Jack W. Frazier et al 1 C. K. Gay et al unit, J. Tumlinson Sur., 4 mi. northwest of Columbus, IP perforations 7,302-14 ft. 70 bbl. open flow, and from perforations 7,667-70 ft., flowed 35 bbl. Dual completion in Wilcox.

DABOVAL—Wharton County, October Amerada Petroleum Corp. 1 Chas. J. P Daboval, J. Bagnal Sur., 7 mi. south of El Campo, IP 80 bbl. through perforations 7,025-28 ft.

EAST FANNETT — Jefferson County, April, Sun Oil Co. 1 Florence Wingate et al, 2½ mi. east of Fannett, IP 69 bbl. from Frio perforated 8,665-77 ft.

EAST MAURITZ—Jackson County, June, John B. Coffee et al (Roxie Wright) 1

H. Huseman, Morris & Cummings Sur., 2 mi. northeast of Mauritz field, IP 52 bbl. from Frio perforations 5,662-68 ft.

EL CAMPO—Wharton County, January, Seaboard Oil Co. 1 W. W. Duson, 5 mi. southeast of El Campo, IP 185 bbl. through Frio perforations 6,150-54 ft.

EL CAMPO—Wharton County, July, Seaboard Oil Co. of Delaware 1 Rudolph Holub, E. L. Wilson Sur., dual completion, upper sand topped 6,808 ft., perforated 6,820-24 ft., IP 157.17 bbl., lower sand perforated 7,588-92 ft., dry gas.

EL CAMPO—Wharton County, Seaboard Oil Co. of Delaware 1 Reba S. Snell, E. L. Wilson Sur., lower sand topped 7,380 ft., perforated 7,380-84 ft., IP 382,000 cu. ft. gas, 7½ bbl. condensate; upper sand topped 6,147 ft., perforated 6,147-52 ft., IP 104.86 bbl. (dual completion).

EL TORO—Jackson County, July, Butcher-Arthur Co. 1 A. Lorenzen, J. Linn Sur., 4 mi. southeast of El Toro, IP estimated 1,250,000 cu. ft. dry gas through perforations 5,820-30 ft.

FRELSBURG—Colorado County, June, Sinclair Prairie Oil Co. 1 A. J. Thompson, Chas. Fritshe Sur., 3 mi. southwest of New Ulm, dual completion in Wilcox, perforations 8,177-82 ft., IP 73 bbl. and perforations 9,288-98 ft., 59 bbl.

HOPE—Lavaca County, October, Sterling Oil & Refining Co. 1 Charles Hoffman, D. B. Oaks Sur., 2 mi. southeast of Hope, IP 93.3 bbl. condensate and 3,853,000 cu. ft. gas through perforations 7,716-50 ft.

HUNGERFORD—Wharton County, May, Superior Oil Co. of California 1 W. J. Hudgins, J. W. Moore Sur., 3 mi. north of Hungerford, IP 1,545,000 cu. ft. dry gas through perforations 3,026-31 ft.

LANE CITY—Wharton County, November, General Crude Oil Co. 2 Security Bank & Trust Co., 4 mi. southwest of Lane City, IP 124 bbl. through perforations 5,345-50 ft.

LA SALLE—Jackson County, January, Seaport Oil Co. 1 Bennett, Ramon Musquez grant, 2 mi. west of Vanderbilt, IP 48 bbl. through perforations 5,062-66 ft. in Marginulina-Frio. No gage on gas from perforations 5,580-82 ft.

NADA—Colorado County, January, Ohio Oil Co. 1 C. W. McDermott, Johnson & Stafford Sur., 4 mi. southwest of Nada, IP 98 bbl. from Cockfield, perforated 6,512-20 ft.

NADA—Colorado County, May, Northern Ordnance, Inc., 1 Homer Ammann et al, 6 mi. southwest of Garwood, AB&M Sur., IP 132 bbl. through perforations 6,760-65 ft.

NORTH BEECH CREEK—Hardin County, April, American Republics Corp.-Houston Oil Co. of Texas 1 Olive Sternenberg & Co., H&TC Sur. 795, IP 111 bbl. oil and 150 bbl. salt water through perforations 6,230-32 ft. in Cockfield sand.

NORTH CORDELE — Jackson County, June, Akron Production Co. 2 Joseph Wearden, I&GNRR Sur., 2 mi. north of Cordele, IP estimated 750,000 cu. ft. dry gas through perforations 4,126-36 ft. in Frio.

NORTH LOVELL LAKE — Jefferson County, November, Humble Oil & Refining Co. 1-C Jefferson Land Co., Shelby Corzine Sur., IP 86.49 bbl. through perforations 7,176-80 ft.

NORTH WINNIE — Chambers County, April, Sun Oil Co. 1 Dougherty, F. Valmore League, Abstract 26, IP 154 bbl. through perforations 8,757-59 ft. in Frio.

NORTH WINNIE — Chambers County, September, Sun Oil Co. 1 W. L. Evans, J. N. Duran League, IP 61 bbl. distillate and 3,124,000 cu. ft. gas through perforations 9,434-51 ft.

SMITH POINT—Chambers County, February, Standard Oil Co. of Texas 1-109 State, 1 mi. west of Smith Point, IP 250 bbl. through perforations 8,135-46 ft.

SMITH POINT—Chambers County, June, Standard Oil Co. of Texas 3-109 State-Galveston Bay, State Land Section 109, IP 16,000,000 cu. ft. gas through perforations 9,442-58 ft.

SPRING—Harris County, September, El Tex, Ltd., 1 Bender estate, ½ mi. south of Spring in Mary C. Bulrice Sur., IP 128 bbl. through perforations 6,243-47 ft.

SUBLIME—Colorado County, November, Tide Water Associated Oil Co. 1 D. L. Underwood, 3 mi. northwest of Sheridan, IP 79.2 bbl. through perforations 9,500-05 ft.

VILLAGE MILLS—Hardin County, October, Houston Oil Co. of Texas and American Republics Corp. 1 fee-Hardin County School Land, 5 mi. south of Warren, IP 47,000,000 cu. ft. gas through perforations 5,798-5,812 ft.

WORD — Lavaca County, September, Moran Gas Co. 1 Lell & Lell, J. Kerr Sur., 4½ mi. southwest of Halletsville, IP 60 bbl. through perforations 5,914-18 ft.

UNNAMED—Colorado County, December, Sinclair Prairie Oil Co. 2 C. G. Glasscock, in Collier Sur., 6 mi. north of Rock Island, IP 120 bbl. through perforations 9,203-26 ft. and 9,274-80 ft.

UNNAMED—Matagorda County, December, Skelly Oil Co. 1 Granbury-Fullilove unit, Amos Rawls League, 3 mi. northeast of Van Vleck, IP 42 bbl. condensate and 2,137,000 cu. ft. gas through perforations 8,739-47 ft.

NEW PAYS

BLUE RIDGE—Fort Bend County, January, Phillips Petroleum Co. 3 William R. Robinson, Hicks Shropshire Sur., IP 5 bbl. pumping, perforations 4,102-04 ft.

DANBURY — Brazoria County, June, Humble Oil & Refining Co. 1 Charles Dvorsky et al, W. B. Chambers Sur., east flank, IP 3,000,000 cu. ft. gas and 30 bbl. condensate through perforations 8,074-84 ft. and 8,036-54 ft.

FANNETT — Jefferson County, July, Gulf Oil Corp. 14 C. W. Burrell et al, William H. Smith Sur., IP 217 bbl. through perforations 6,439-49 ft.

FANNETT — Jefferson County, April, Gulf Oil Corp. 1-A Leo Craigen, W. H. Smith Sur., IP 331 bbl. through perforations 6,984-98 ft.

HARMON—Jackson County, February, J. A. Gray 1 W. W. McCrory et al, M. L. York Sur., IP 96 bbl. through perforations 5,398-5,402 ft.

HULL—Liberty County, June, John W. Mecom 1 Abshier et al unit, Jesse Devore Sur., IP 531 bbl. through perforations 6,940-70 ft., 187 bbl. through perforations 6,810-40 ft.

HUMBLE—Harris County, April, Sun Oil Co. 32 Bender, W. B. Adams 1/3 Lge. Sur., northwest flank, IP 131 bbl. through perforations 5,050-78 ft.

HUMBLE—Harris County, February, The Texas Co. 55 Stevenson, J. B. Stevenson Sur., east flank, IP 292.14 bbl. through perforations 4,885-4,900 ft.

HUMBLE — Harris County, July, The Texas Co. 275 Landslide, Robert Dunman Sur., southeast flank, IP 90.64 bbl. through perforations 4,640-70 ft.

JOYCE RICHARDSON—Harris County, May, General Crude Oil Co. 1 Vinnie T. Rorick, J. C. Ogburn Sur., IP 194.76 bbl. through perforations 7,141-45 ft.

LIVINGSTON — Polk County, April, Humble Oil & Refining Co. 7 C. B. Granbury et al, Augustine Viesca grant, IP 668.22 bbl. from Wilcox sand topped at 6,987 ft.

NEEDVILLE—Fort Bend County, August, British-American Oil Producing Co. 1 Hurta, 3 mi. south of Needville, IP 110.78 bbl. through perforations 6,025-32 ft.

NEEDVILLE—Fort Bend County, October, W. L. Goldston 3 E. C. Farmer, Robert Hodge Sur., IP estimated 2,750,000 cu. ft. dry gas through perforations 3,962-76 ft.

NORTH LA WARD—Jackson County, February, Amerada Petroleum Corp. 2 J. A. Graves et al, Patrick Scott Sur., IP 56 bbl. through perforations 5,818-23 ft.

SOUR LAKE—Hardin County, November, Sun Oil Co. 1 Merchant estate, Stephen Jackson Sur., IP 132 bbl. through perforations 6,335-65 ft.

WEST GANADO—Jackson County, February, Pure Oil Co. 1 Della Weise, William Menefee Sur., IP 104 bbl. through perforations 6,174-88 ft.

NORTH LOUISIANA

BEAR CREEK—Bienville Parish, September, Southern Natural Gas Co. 1 Cummings, 1-16n-6w, Pettit 6,745-65 ft., IP 63 bbl.

BENTON — Bossier Parish, October, Barnsdall Oil Co. 1 Hanks, 7-20n-12w, Cotton Valley "D" 8,001-40 ft., IP 164 bbl.

DELHI — Richland Parish, December, Murphy 1 Holt, 21-17n-9e, Tuscaloosa 3,280-90 ft., IP 218 bbl.

MANSFIELD—DeSoto Parish, October, Johnson 1 Gay, 3-11n-13w, Eagleford 2,728-38 ft., IP 15 bbl.

SICILY ISLAND—Catahoula Parish, December, California Co. 1 Tensas Delta, 12-9n-7e, Tuscaloosa 8,512-44 ft., IP 25 bbl.

TREMONT — Lincoln Parish, October, California Co. 1 Norris, 15-18n-1w, Cotton Valley 9,060-80 ft., IP 97 bbl. distillate.

SOUTH LOUISIANA

BAYOU DES GLAISE—Iberville Parish, May, Humble Oil & Refining Co. 4-B Wilberts Mineral Corp., 76-8s-8e, perforations 9,841-53 ft., IP 554 bbl.

BAYOU PENCHANT—Terrebonne Parish, March, Superior Oil Co. of California 1 Continental Land & Fur Co., 30-18s-14e, IP 19 bbl. condensate and 3,570,000 cu. ft. of gas through perforations 9,929-35 ft.

BAYOU SERPENT — (Indian Village), Jefferson Davis Parish, October, Continental Oil Co. 1 King Corp., 30-7s-6w, Ortego sand, IP 178 bbl. through perforations 7,135-45 ft.

COLLEGE POINT — St. James Parish, November, Humble Oil & Refining Co. 1 Mrs. Roana R. Keller et al, 31-12s-4e, IP 114 bbl. condensate and 4,260,000 cu. ft. gas through perforations 10,664-90 ft.

CROWLEY — Acadia Parish, October, Phillips Petroleum Co. 1 Onezime, 16-10s-1e, IP 33 bbl. through perforations 9,738-41 ft.

EAST MOSS LAKE — Calcasieu Parish, May, Continental Oil 1 Prairie Land & Canal Co., 2-11s-9w, IP 113 bbl. condensate from Marginulina Hackberry 10,410-20 ft.

GOOD HOPE—St. Charles Parish, August, Pure Oil Co. 1 General American Transportation Corp., 7-12s-8e, IP 293 bbl. through perforations 7,830-38 ft.

GORDON — Beauregard Parish, March, Union Oil Co. of California 1 Edgewood Land & Logging Co. 25-6s-10w, IP 32 bbl. condensate through perforations in basal Frio 6,767-70 ft.

GUM COVE—Cameron Parish, February, Magnolia Petroleum Co. 2 R. A. Moore, 13-12s-12w, IP 85 bbl. through perforations 9,142-47 ft.

LAUREL RIDGE—Iberville Parish, July, Humble Oil & Refining Co. 1 Adam Hymel et al, 91-10s-13e, IP 113 bbl. through perforations 10,688-705 ft.

NORTH CANKTON—St. Landry Parish, April, Sun Oil Co. 1-B E. M. Boagni estate, 48-8s-4e, IP 470 bbl. through perforations 9,667-90 ft., in Hackberry sand.

WEST TEPETATE—Jefferson Davis Parish, October, Barnsdall Oil Co. et al 1 P. and M. D. Miller estate, 38-7s-3w, IP 794 bbl., Ortego sand perforated 8,516-28 ft.

SOUTH LAKE CHARLES—Calcasieu Parish, November, 5 miles east of East Moss Lake field, Continental Oil Co. 1 Glen Greathouse et al, IP 130 bbl. through perforations 10,018-26 ft.

NEW PAYS

ANSE LA BUTTE—St. Martin Parish, November, Stanolind Oil & Gas Co. 1 Bella Nickerson, 61-9s-5e, IP 203 bbl. from 10,995-11,025 ft.

ARNAUDVILLE—St. Martin Parish, April, Amerada Petroleum Corp. 1 Kidder Unit, 44-7s-5e, IP 37 bbl. through perforations 9,914-17 ft.

AVERY ISLAND—Iberia Parish, July, Humble Oil & Refining Co. 1-B Pettit Anse Co., Inc., 23-13s-5e. IP 369 bbl. through perforations 10,162-75 ft.

BRANCH—Acadia Parish, September, Union Sulphur Co. 3 J. P. Guerro estate, 51-8s-2e, IP 177 bbl. through perforations 11,085-90 ft.

BULLY CAMP—LaFourche Parish, April, Gulf Refining Co. 6 Delta Securities, 36-18s-20e, IP 312 bbl. from 6,510-30 ft.

CAILLOU ISLAND—Terrebonne Parish, May, The Texas Co. 29 State Lease 188, Timbalier Bay-23s-20e, IP 232 bbl. through perforations 11,052-102 ft.

CHINA—Jefferson Davis Parish, Continental Oil Co. and Union Sulphur Co. 1 H. J. Shoesmith, 1-8s-4e, IP 32.46 bbl. through perforations 9,188-99 ft.

DE LARGE—Terrebonne Parish, August, Union Producing Co. 2 Buckley-Bourge, 1-20s-16e, IP 648 bbl. through perforations 13,498-503 ft.

EAST HACKBERRY—Cameron Parish, November, Stanolind Oil & Gas Co. 35-B Gulf Land Co., 10-12s-10w, IP 308 bbl. through perforations 10,804-16 ft.

EGAN—Acadia Parish, June, Sun Oil Co. 1 C. J. Freeland et al, 29-9s-1w, IP 502.2 bbl. through perforations 10,765-75 ft.

EGAN—Acadia Parish, January, Sun Oil Co. 1 W. L. Trimble, 31-9s-1w, IP 88 bbl. through perforations 10,480-508 ft.

ERATH—Vermilion Parish, March, recompleted June, Phillips Petroleum Co. 1 Adelaide, 28-13s-4e, IP 228 bbl. through perforations 7,371-76 ft. Originally completed through perforations 7,345-97 ft., well went to 60 per cent water, squeezed perforations and reworked.

GORDON—Beauregard Parish, July, Union Oil Co. of California 3 Edgewood Land & Logging Co., 25-6s-10w, IP 106 bbl. through perforations 5,319-21 ft. Opens first oil production for area.

HESTER—St. James Parish, November, Humble Oil & Refining Co. 1 Louis G. Laiche et al, 69-11s-5e, IP 144 bbl. from 11,073-93 ft.

KROTZ SPRINGS—St. Landry Parish, January, Gulf Refining Co. 1-A "E" Haas-Hirsch, 12-6s-7e, IP 300 bbl. Originally completed as discovery well of Krotz Springs, abandoned in 1937, reworked and deepened 1944 and producing from perforations 9,418-22 ft.

LEEVILLE—LaFourche Parish, June, The Texas Co. 93 LL&E-Leeville, 34-21s-22e, IP 260 bbl. through perforations 11-408-28 ft.

LOCKPORT—Calcasieu Parish, March, Magnolia Petroleum Co. 36 Mathilda Miller, 9-10s-9w, IP 125 bbl. through perforations 7,252-79 ft.

NORTH ELTON—Allen Parish, May, Bel Oil Corp. 1 D. Jones, 23-6s-3w, IP 32.48 bbl. 3,340,000 gas, through perforations 6,849-52 ft.

NORTH TEPETATE—Acadia Parish, June, Humble Oil & Refining Co. 1 M. L. Vincent, Jr. et al, 25-7s-2w. IP 273 bbl. through perforations 7,847-50 ft. First oil for field.

PINE PRAIRIE—Evangeline Parish, February, Hassie Hunt, Tr. 3-C Crowell Land & Mineral Corp., IP 235 bbl. through perforations 9,490-522 ft. and 9,540-70 ft. in Sparta sand.

PINE PRAIRIE—Evangeline Parish, March, Gulf Refining Co. 2 Schleicher-Thomas, 37-3s-1w, IP 270 bbl. through perforations 9,950-70 ft. in Wilcox.

POTASH—Plaquemines Parish, February, Humble Oil & Refining Co. 2 State Lease 508, 30-18s-15e, IP 11.5 bbl. through perforations 9,290-310 ft.

POTASH—Plaquemines Parish, August, Humble Oil & Refining Co. 66 Orleans Levee Board, 13-18s-15e, IP 72 bbl. through perforations 1,802-20 ft.

ROSEDALE—Iberville Parish, April, Sugarfield 1 Leo Row (Slack Brothers), 107-7s-10e, IP 172 bbl. through perforations 10,134-38 ft.

SOUTH ROANOKE—Jefferson Davis Parish, May, Continental Oil Co. 4 Joe Sturdivant, 35-10s-4w, IP 194 bbl. through perforations 11,348-56 ft.

STARKS—Calcasieu Parish, February, W. T. Burton 10 Lutcher Moore Lumber Co., 13-9s-13w, IP 145 bbl. through perforations 8,045-55 ft.

VACHERIE—St. James Parish, July, Humble Oil & Refining Co. 1 St. Joseph Planting & Manufacturing Co., Ltd., 12-12s-17e, IP 71 bbl. and 1,975,000 cu. ft. gas through perforations 9,118-28 ft.

VENICE—Plaquemines Parish, February, Tide Water Associated Oil Co. 24 Buras Levee Board, 34-21s-30e, IP 268 bbl. through perforations 10,956-74 ft.

WEST BAY—Plaquemines Parish, February, Gulf Refining Co. 9 State "PP", 2-23s-30e, IP 581 bbl. through perforations 10,442-52 ft.

WEST GUEYDAN—Vermilion Parish, November, Pure Oil Co. 1 Ferguson-Benoit Unit, southeast flank, IP 213 bbl. oil, 120,000 cu. ft. gas through perforations 9,619-23 ft.

WEST WHITE LAKE—Vermilion Parish, October, Union Oil Co. of California 2-A State Lease 540, 29-14s-2w, IP 158 bbl. through perforations 10,684-88 ft.

ARKANSAS

CALHOUN—Columbia County, March, Tidewater and Seaboard Oil companies 1 Pearce, NE NW 10-18s-20w, Smackover lime 8,282-87 ft. and 8,290-98 ft., IP 32 bbl.

SALEM CHURCH—Union County, July, Carter Oil Co. 1 Wilson, C-106, SW NW 33-16s-18w, Smackover lime 6,985-96 ft., IP 98 bbl.

WILKS—Union County, February, Atlantic Refining Co. 1 Murphy, NW SW 2-18s-18w, Smackover lime 7,861-63 ft., IP 100 bbl.

MISSISSIPPI

BAXTERVILLE—Lamar County, November, Gulf Oil Co. 1 Cooper, 7-1n-16w, Massive sand 8,690-8,714 ft. and 8,734-44 ft., IP 757 bbl.

GWINVILLE—Jeff Davis County, September, Richardson 1 Berry, 24-9n-19w, Tuscaloosa and Lower Eutaw 8,120-32 ft., 7,855-80 ft., and 8,075-8,105 ft., IP 65 bbl. distillate.

HEIDELBERG—Jasper County, February, Gulf Oil Co. 1 Morrison, 30-1n-13e, Eutaw 4,958-68 ft., IP 492 bbl.

MALLALIEU—Lincoln County, August, California Co. 1 Douglas, 10-6n-8e, Tuscaloosa 10,515-560 ft., IP 374 bbl.

ALABAMA

GILBERTOWN—Choctaw County, February, H. L. Hunt 1 Jackson, 2-10n-4w, Selma chalk 2,561-85 ft., IP 30 bbl.

MELVIN—Choctaw County, September, H. L. Hunt 2 Land, 36-11n-5w, Eutaw 2,832-38 ft., IP 50 bbl.

OKLAHOMA

ARCADIA, NORTHEAST—Oklahoma County, July, A. R. Jordan 1 Williams, SW SE SW 11-14n-1w, Wilcox 5,980-97 ft., IP 1,248 bbl.

AUTWINE—Kay County, May, Robert H. Lynn 1-A School, SW SW SW 13-26n-1w, Mississippi chat 3,901-11 ft., IP 22 bbl.

CENTERPOINT, SOUTH—Pottawatomie County, November, Cities Service Oil Co. 1 Harbour, NE NE NW 13-9n-2e, Earlsboro sand 4,914-63 ft., IP 43 bbl.

CHEYARHA—Seminole County, January, Gulf Oil Co. 1 Duley, 28-10n-7e, Booch 3,415-41 ft., IP 183 bbl.

CRESENT, EAST—Logan County, January, Gulf Oil Co. 1 Pritchard, NW NW 22-17n-3w, Layton 4,740-66 ft., IP 60 bbl.

CRESENT, NORTHEAST—Logan County, April, Atlantic Refining Co. 1 Kerfoot, SE SE NE 31-18n-3w, second Wilcox 6,270-76 ft., IP 100 bbl.

HICKORY GROVE—Creek County, August, Sinclair Prairie Oil Co. 1 Watson, SW NE SE 34-15n-7e, Prue 2,619-38 ft., IP 230 bbl.

HOOVER, NORTHWEST—Garvin County, June, Helmerick & Payne 2 Freeman, SE SE 14-1n-1w, Pontotoc 1,070-1,119 ft., IP 140 bbl.

HORN'S CORNER, NORTH—Hughes County, March, Deep Rock Oil Co. 1 Myers, SE SE NE 7-7n-10e, Cromwell 3,587-90 ft., IP 386 bbl.

INGALLS, NORTHWEST—Payne Couty, March, Stanolind Oil & Gas Co. 1 School Land, NE SE SW 16-19n-4e, second Wilcox 4,033-41 ft., IP 125 bbl.

LONE GROVE, SOUTHWEST—Carter County, May, Texas Co. 1 Chubbee, NW NW SW 5-5s-1w, Pennsylvanian sand 2,760-84 ft., IP 2,143 bbl.

MOORE, SOUTH—Cleveland County, June, Mid-Continent Petroleum Co. 1 Westermeier, NE SW SW 26-10n-3w, second Wilcox and Bartlesville 8,833-66 ft., IP 757 bbl.

MOORE, WEST—Cleveland County, January, Mid-Continent Petroleum Co. 1 Harris, NW SE SW 29-10n-3w, second Wilcox 8,784-92 ft., IP 223 bbl.

MORAL, NORTHEAST—Pottawatomie County, April, Stanolind Oil & Gas Co. 1 Werrell, NW NW NW 9-7n-3e, Hunton 4,540-60 ft., IP 346 bbl.

NOBLE, WEST—McClain County, October, Carter Oil Co. 1 Johnson, SW SE 30-8n-2w, Bromide 8,190-8,222 ft., IP 300 bbl.

PADIN NORTH—Okfuskee County, September, Kerlyn-Phillips 1 Fixico, SE NW NW 10-12n-7e, Dutcher 3,730-72 ft., IP 38 bbl.

PETTIQUAH—Okfuskee County, February, Northern Ordnance, Inc. 1 Klabzuba, SW NW 7-13n-7e, Red Fork 3,226-57 ft., IP 127 bbl.

SUMNER, WEST—Noble County, January Gulf Oil Co. 1 Juanita, NE NE NE 1-21n-1e, second Wilcox 4,590-98 ft., IP 926 bbl.

WASHINGTON—McClain County, May, Carter Oil Co. 1 Cottingham, SE SW 4-7n-3w, second Wilcox 10,635-45 ft., IP 300 bbl.

UNNAMED—Logan County, October, Eason Oil Co. 1 Michael, SW SW NW 12-17n-4w, Layton 4,910-29 ft., IP 90 bbl. distillate.

UNNAMED—Lincoln County, October, Sinclair Prairie Oil Co. 1 Danker, SE NW SE 28-14n-3e, Cleveland 3,475-98 ft., IP 138 bbl.

UNNAMED—Garvin County, September, Sinclair Prairie Oil Co. 1 Allred, NE NW SE 30-3n-3e, Bromide 1,898-1,919 ft., IP 105 bbl.

UNNAMED—Hughes County, March, Creekmore-Rooney 1 Dannenberg, NW NW 35-9n-10e, Cromwell 3,168-72 ft., IP 400 bbl.

UNNAMED—Hughes County, July, Phillips Petroleum Co. 1 Meadors, SE NW SE 14-9n-9e, Gilcrease 2,780-2,800 ft., IP 125 bbl.

UNNAMED—Hughes County, September, Bartlett et al 1 Smith, NW SW NE 27-6n-8e, Booch 2,631-65 ft., IP 10 bbl.

UNNAMED—Logan County, October,

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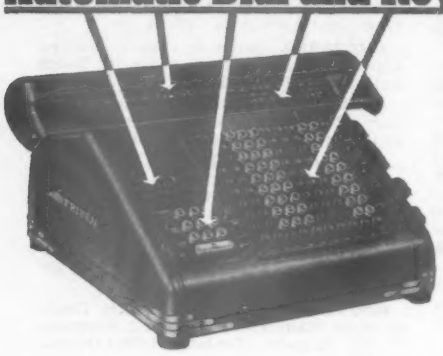

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Kerlyn & Phillips 1 Green, SE NW 36-18n-4w, Layton 4,806-33 ft., IP 192 bbl.

UNNAMED—Okfuskee County, September, Kubat & Phillips 1 Overall, SW SW NW 15-11n-9e, Hunton 3,898-3,910 ft., IP 135 bbl.

UNNAMED — Pontotoc County, July, Shaw 1 Jackson, NE NE SW 32-5n-6e, second Cromwell 1,907-40 ft., IP 13 bbl.

KANSAS

ADELL—Sheridan County, June, Continental Oil Co. 1 Cramer, NW NW NE 11-6-27w, Lansing 3,752-62 ft., IP 840 bbl.

ALDA — Graham County, November, Skelly Oil Co. 1 Davis, NW NW NW 15-7-22w, Lansing-Kansas City 3,518-24 ft., IP 518 bbl.

ARNOLD—Ness County, January, Sohio Oil Co. 1 Frevely, SE SE 22-16-25w, Mississippi lime 4,528-50 ft., IP 142 bbl.

BEISEL—Russell County, April, Bridgeport 1 Beisel, 15-14-12w, Arbuckle 3,266-82 ft., IP 64 bbl.

CADMAN — Stafford County, August, Faulkner 1 Cadman, SE SE NW 4-25-13w, crystalline Viola 4,066-75 ft., IP 25 bbl.

CLAUSSEN—Russell County, May, Goff-Davis 1 Claussen, SW SW SW 27-12-14w, Lansing 2,854-61 ft., IP 10 bbl.

CLEARWATER—Sedgwick County, September, Branine & Hall 1 Sautter, SE SE NE 22-29-2w, Lansing 3,025-36 ft., IP 205 bbl.

CLICK—Rice County, January, Phillips Petroleum Co. 1 Click, SE SE NE 3-18-7w, Misener 3,182-87 ft., IP 112 bbl.

COATS—Pratt County, April, Lion Oil Co. 1 Andrews, 24-29-14w, Simpson 4,405-09 ft., IP 730 bbl.

HOBART — Rooks County, February, Continental Oil Co. 1 Welch, NE NE NE 33-8-18w, Lansing 3,209-21 ft., IP 708 bbl.

KANSADA—Ness County, June, Skelly Oil Co. 1 Norton, NW NW NW 23-17-26w, Mississippi lime 4,450-61 ft., IP 84 bbl.

LUDWICK — Pratt County, September, Skelly Oil Co. 1 Schaw, NW NW NW 4-29-13w, Simpson 4,489-99 ft., IP 142 bbl.

MARCOTTE—Rooks County, February, Champlin Refining Co. 1 Marcotte, SE NE SW 15-10-20w, Arbuckle 3,753-58 ft., IP 2,711 bbl.

McCANDLESS—Stafford County, April, Atlantic Refining Co. 1 McCandless, SW SE 30-25-13w, Simpson 4,251-67 ft., IP 734 bbl.

PALCO—Rooks County, February, Continental Oil Co. 1 Bruggeman, NE NE NE 5-10-20w, Arbuckle 3,824-43 ft., IP 3,000 bbl.

PETTERSON—Greenwood County, September, Weideman 1 Petterson, SE NE NE 19-27-11e, Arbuckle 2,406-07 ft., IP 25 bbl.

PLEASANT — Ellis County, September, Sunray Oil Co. 1 Orth, NE NE SW 2-14-20w, Reagan 3,846-52 ft., IP 563 bbl.

PRITCHARD — Barton County, May, Texas Co. 1 Pritchard, NE NE SE 34-20-14w, Arbuckle 3,541-48 ft., IP 1,526 bbl.

RICHLAND—Stafford County, February Atlantic Refining Co. 1 Neil NW NW NE 27-24-14w, Arbuckle 4,225-40 ft., IP 220 bbl.

SHRIVER—Pratt County, October, Skelly Oil Co. 1 Shriver, NE NE NE 33-29-14w, Simpson 4,557-64 ft., IP 344 bbl.

SMYRES, NORTH — Rice County, December, Nelson Drilling Co. 1 Allison, 23-19-6w, Mississippi lime 3,342-84 ft., IP 15 bbl.

ST. JOHN'S TOWNSITE—Stafford County, June, Stanolind Oil & Gas Co. 1 Delker, SE SE NE 33-23-13w, Arbuckle 3,919-24 ft., IP 2,359 bbl.

ST. PETER—Barton County, June, C. E. Ash 1 Schloctermeyer, SW SW SE 5-19-11w, Arbuckle 3,387-3,407 ft., IP 586 bbl.

WORKMAN—Barton County, September, Vickers Petroleum Co. 1 Workman, NE NE NE 33-20-12w, Arbuckle 3,408-55 ft., IP 69 bbl.

YOUNGER—Ellis County, October, Sunray Oil Co. 1 Younger "B", SE SE NE 6-14-17w, Arbuckle 3,523-68 ft., IP 50 bbl.

ZURICH TOWNSITE — Rooks County, February, Cities Service Oil Co. 1 Sikes, SW SW SW 27-9-19w, Arbuckle 3,644-50 ft., IP 1,326 bbl.

ZYBA, SOUTHWEST—Sumner County, August, M. J. Sullivan 1 Nixon, NE NE 22-30-1w, Simpson 3,917-29 ft., IP 209 bbl.

SKINNER — Barber County, February, Deep Rock Oil Corp. 1-B Skinner, W/2 NW SE 29-31-14w, Viola 4,624 ft., IP 278 bbl.

ILLINOIS

BENNINGTON, S. — Edwards County, July, Nash Redwine 1 Jones, SE NW NE 31-1n-10e, McClosky lime, 3,238 ft., IP 132 bbl.

BOGOTA, S. — Jasper County, July, Schuller & Witt 1 Lawrence, NE SW SE 3-5n-9e, McClosky lime, 3,054-65 ft., IP 57 bbl.

BOYD—Jefferson County, August, Cameron 1 Bizot, NE NE NW 13-1s-3e, Bethel sand 2,050 ft., IP 167 bbl.

CALHOUN—Richland County, August, Phillips Petroleum Co. 1 Jennings, NE NE SE 6-2n-10e, Levias lime, 3,166 ft., IP 178 bbl.

DIVIDE, W.—Jefferson County, February, The Texas Co. 1 Green, E/2 SE SE 15-1s-3e, McClosky lime, 2,752-2,856 ft., at intervals, IP 85 bbl.

HOODVILLE, E. — Hamilton County, June, National Associated Petroleum Co. 1 Stacker, SE NW NW 33-5s-7e, McClosky lime, 3,364-87 ft., at intervals, IP 80 bbl.

KEENSBURG, S.—Wabash County, Central Pipe Line Co. 1 Garst, NE NE SW 27-2s-13w, Levias lime, 2,713-22 ft., IP 173 bbl.

MAPLE GROVE, E.—Edwards County, June, The Texas Co. 1 Lambright, SW SE SE 1-1n-10e, McClosky lime, 3,215-32 ft., IP 133 bbl.

MT. ERIE, N.—Wayne County, January, Felix Jablonski 1 Yorndorf, NW NE 3-1n-9e, Aux Vases sand, 3,100-19 ft., IP 47 bbl.

NEW HAVEN, N.—White County, July, Sohio Oil Co. 1 Union Central Life, SE NE NW 10-7s-10e, Tar Springs sand 2,174-83 ft., IP 40 bbl.

NEW HAVEN, W.—Gallatin County, August, Oil Management 2 Goforth, SE SE SW 27-7s-10e, Tar Springs sand 2,089-2,115 ft., IP 184 bbl.

ROACHES, N.—Jefferson County, August, The Texas Co. 1 Kasban, SE SE NW 5-2s-1e, Rosiclaire lime 2,103-28 ft., IP 221 bbl.

SAILOR SPRINGS, E. — Clay County, August, Magnolia Petroleum Co. 1 Rinnert, NE NE NE 33-4n-8e, Cypress sand 2,690-2,700 ft., IP 32 bbl.

SUMNER — Lawrence County, August, The Texas Co. 1 Smith, SE SE NE 16-4n-13w, McClosky lime, 2,261-71 ft., IP 65 bbl.

THACKERAY — Hamilton County, August, National Associated Petroleum Corp. 1 Johnson, NE SW SE 10-5s-7e, Aux Vases sand 3,384-3,401 ft., IP 60 bbl.

INDIANA

DECKER—Knox County, April, William P. Mueller 1 McDowell, 36-2n-11w, McClosky lime 1,857-65 ft., IP 22 bbl.

NEW HARMONY, SOUTH—Posey County, January, Sells Petroleum Co. 1 Wade, 14-5s-14w, Hardinsburg sand 2,446-65 ft., IP 298 bbl. oil, 15 bbl. water.

SOUTH OWENSVILLE—Gibson County, August, Cherry & Kidd 1 Baird, 25-3s-12w, McClosky lime, 2,514-19 ft., IP 16 bbl.

UPTON—Posey County, January, Bennett Bros. 1 Spencer, 32-6s-14w, Tar Springs sand 2,142-49 ft., IP 86 bbl. oil, 86 bbl. water.

UNNAMED—Jay County, September, L. R. Freel 1 F. Theurer, 22-23n-15e, October, Trenton lime top 1,104 ft., TD 1,181 ft., IP 15 bbl.

UNNAMED — Pike County, September, H. C. Detrick 1 Charles Knick, 8-1s-7w, Cypress sand 1,135-39 ft., IP 180 bbl.

UNNAMED—Posey County, Rogers Cartage Co. 1 Deakin & Lynch, 25-7s-15w, September, McClosky lime 2,798-2,826 ft., IP 55 bbl. oil and 176 bbl. water.

WESTERN KENTUCKY

POWELL'S LAKE—Union County, August, Gulf Refining Co. 1 Rankin, 16-Q-20, Waltersburg sand 1,811-20 ft., IP 79 bbl.

UTLEY, NORTH—Union County, August, Trans Tex Oil Co. 1 Culver, 12-P-20, Levias lime 2,523-26 ft., TD 2,710 ft., PB to 2,549 ft., pumped 13 bbl.

EAST CLAY—Webster County, August, Carl Sneff et al 1 Page, 9-L-21, Penn sand 1,003-26 ft., IP 124 bbl.

GRASSY POND—Henderson County, December, W. F. Lacey et al 1 T. T. Williams, 4-Q-20, Aux Vases sand 2,596 ft., TD 2,626 ft., IP 67 bbl.

STURGIS — Union County, December, Farmer & Chenault 1 W. W. Slaton, 17-M-19, Hardinsburg sand 1,347 ft., TD 1,361 ft., IP 40 bbl.

CURDSVILLE—Daviess County, September, Shell Oil Co., Inc. 1 Hamilton, 14-O-27, Cypress sand 1,833 ft., TD 2,358 ft., PB to 1,848 ft., IP 37 bbl.

RAPHAEL—Daviess County, April, Miller & Shiarella 1 Simmons, 20-O-27, Aux Vases sand 1,842 ft., TD 2,023 ft., PB to 1,918 ft., IP 25 bbl.

McKINLEY — Henderson County, July, Sohio Oil Co. 1 Rash heirs, 24-O-25, Tar Springs sand 1,710 ft., TD 1,727 ft., IP 89 bbl.

ROCK SPRINGS — Henderson County, September, National Associated Petroleum Co. 1 Rudy, 4-O-23, Cypress sand 2,246 ft., TD 2,251 ft., IP 70 bbl.

MICHIGAN

BARRY — Barry County, March, H. E. Smith 1 Lechleitner, 2-1n-9w, Traverse 1,805-07 ft., IP 60 bbl.

BLOOMER — Montcalm County, August, Wadsworth 1 Peters, 32-9n-5w, Traverse 2,657-60 ft., IP 75 bbl.

COLDWATER—Isabella County, August, Sohio Oil Co. 1 Cummings, 33-16n-6w, Dundee 3,692-98 ft., IP 198 bbl.

DALTON—Muskegon County, January, Muskegon Oil Co. 1 Newbeck, 10-11n-16w, Traverse 1,842-50 ft., IP 60 bbl.

DEEP RIVER—Arenac County, January, Basin Oil Co. and Rayburn 1 Weblo, 8-19n-4e, Dundee 2,838-40 ft., IP 240 bbl.

ENTERPRISE—Missaukee County, April, Sun Oil Co. 1 Miller, 13-23n-5w, Richfield 4,412-14 ft., IP 16 bbl.

FORK, SOUTH—Mecosta County, September, Smith Petroleum Co. 1 Buss, 16-16n-7w, Dundee 3,779-80 ft., IP 50 bbl.

HOPKINS—Allegan County, April, Cook and Fortney 1 Beaver, 4-3n-12w, Traverse 1,576-78 ft., IP 192 bbl.

HOME — Montcalm County, February, Stewart and White 1 Jorgenson, 14-12n-6w, Dundee 3,470-77 ft., IP 96 bbl.

MONTEREY, SOUTH — Allegan County, August, Winchester 1 Fleecer, 27-3n-13w, Traverse 1,623-24 ft., IP 28 bbl.

PINCONNING—Bay County, September, Shell Oil Co. 1 Koth, 2-16n-4e, Dundee 2,898-2,900 ft., IP 500 bbl.

SHERMAN, NORTH — Isabella County, October, Jetter & DeKraft 1 Walch, 18-15n-6w, Traverse 3,201-02 ft. and 3,258-60 ft., IP 24 bbl.

Wildcat Drilling Fails to Open Substantial Volume of New Reserves

by Charles J. Deegan

The past year has witnessed one of the greatest wildcatting campaigns in the history of the industry. This article covers the high spots in each important district, giving a brief outline of the results of this exploration in finding new fields, new pays and extensions to old fields, as the prospects appear in January, 1945.

REPORTS from the various oil field regions of the country on the results of the 1944 exploration campaign have one common theme. The new fields discovered, as they appear at the end of the year, have not proved up any substantial amount of new reserves. On the other hand, new pays in, and extensions to fields discovered prior to 1944, plus revised ideas of the reserves of some of the older fields, have more than taken up the slack.

CALIFORNIA

Despite a heavy wildcatting campaign, the amount of oil reserves discovered in new fields during 1944 was very small. Most of the new fields were in the Valley, in fact most of them were in Kern County, and as of this time, none looks like it would develop into anything exceptionally big.

Extensions and new pays at Elk Hills, Buena Vista Hills and at San Miguelito accounted for important reserves during the year and may add still more as development proceeds and more accurate appraisal of their sustained productive possibilities is established. However, a year of heavy withdrawals to meet the war demands has resulted in a reappraisal of the reserves of many of the older substantial fields. In general they met the test of heavy withdrawals better than anticipated. While some reservoirs are probably being drawn upon too heavily for maximum ultimate recovery, their performance has resulted in substantial increases in estimates of remaining reserves.

ROCKY MOUNTAINS

The amount of new reserves proven in new-field discoveries during 1944 is misleading, if interpreted as a gage of the potentialities for the future. The potential reserves indicated by further development of 1943 discoveries and the probable ultimate recoveries from the 1944 new fields, indicate that relatively enormous proven reserves will be established by further development of existing fields and adjacent structures.

Wyoming had 18 oil discoveries, counting the Embar and Tensleep pays in Big Sand Draw separately. In addition to Big Sand Draw, which ranks first in potential, Crook's Gap, Little Buffalo Basin, Winkleman, Steamboat Butte and Bailey appear to be important.

While Montana completed only 4 oil wells out of 61 wildcats, of which a 300-bbl. well in the Morrison at Dry Creek was the only one of importance, most of the tests were 1,500 to 2,500-ft. wells that were as much stratigraphic tests as actual wildcats, since it was about as cheap to fill in the regional geological picture in that way as by the usual methods.

Colorado's two new discoveries were relatively small, but extensions to the old Rangely field indicate it may take rank as a major pool, and is probably the largest field ever discovered in Colorado. Extensions and new pays in the Power Wash field have opened new prospects for Tertiary structures over a wide area.

KANSAS

There were 28 new fields discovered in Kansas during 1944, most of which were either extensions to the northwest trend of the Central Kansas Uplift, fillins in the older areas along the trend, or in the Pratt, Stafford, Barber County area south of the uplift. At the end of the year, none of the new discoveries seems of outstanding importance, although some geologists were of the opinion that the Viola development around northwest Barber County might eventually uncover something big.

OKLAHOMA

There were 29 new pools discovered in Oklahoma during the year, but all were overshadowed by the continued extension of West Edmond which expanded into a major field during 1944 and is the scene of the largest concentration of heavy-duty drilling rigs in the country. As the year ended, there was at least a possibility that another 5 mile south extension might be opened which would give the field a length of nearly 20 miles.

The influence of West Edmond on interest in the Anadarko Basin and the chances of finding additional pools on the opposite or east side of the Nemaha Ridge, resulted in successful wildcats opening up Simpson production in the Cleveland and McClain County area, and the discovery of a Layton and a Wilcox pool in Logan County.

The West Moore and South Moore pools failed to develop into large areas in the Ordovician pays, but as the year ended, the potential prospects became more impressive for substantial Bartlesville sand production in the area. The Washington and West Noble discoveries remained in doubtful status so far as size is concerned. They are supposed to be drilled on local highs on a regional high but unless a larger area than the local high produces they will have to be written off as disappointments, as the wells are too deep and expensive to develop for insignificant recovery.

Garvin and Carter counties registered two shallow pools, Hoover and Lone Grove, respectively. In southwestern Oklahoma along the south rim of the Anadarko Basin, prospects at the West Sentinel pool remained doubtful owing to unsolved problems in shutting off water in the granite wash pay zones.

ILLINOIS

Despite a large and scattered wildcatting campaign, none of the 15 new discoveries of 1944 appears to

be of any great size. The net results of the year appear to be mostly a matter of filling in a few gaps here and there; finding a few new pools around the edges of the basin.

ARKANSAS-NORTH LOUISIANA

The outstanding developments were in northeast Louisiana in an area that geologically seems to belong with the play in Mississippi. The Lake St. John and North Lake St. John pools turned out to be one field, a salt dome, with Tuscaloosa production of condensate in the higher portion of the structure and oil in the lower, plus some Wilcox oil. The same conditions prevailed in the Holly Ridge and Holly Ridge North pools. The finding of oil near Delhi, in Richland Parish, along the flank of the Monroe-Richland igneous uplift, opened up a large new prospective wildcat territory around the flanks of that geological feature.

MISSISSIPPI-ALABAMA

As 1944 opened, this territory was highly regarded as a prospective oil area. The year closed with these expectations adequately confirmed. The discovery and rapid development of the Heidelberg pool in Jasper County, and extensions to the Eucutta pool of Wayne County and the Cranfield pool in Adams County encouraged more wildcatting.

It appears now that all of these fields are probably associated with deep-seated salt domes. And there is an east-west area 150 miles long from the Lake St. John pool of Tensas Parish, Louisiana, to the Eucutta pool in Wayne County, Mississippi, with discoveries spotted at intervals. In addition, the Baxterville discovery in Lamar County is also believed to be on a deep-seated dome.

The reserves established as "proven" by present discoveries and extensions are probably only a small fraction of those that will be recorded within the next few years.

EASTERN TEXAS

Almost half of the wells drilled in 1944 were wildcats, resulting in the discovery of nine new fields, of which Winnsboro and Sand Flat looked the most promising at the end of the year. Additional drilling resulted in extensions and new pays at Manziel and New Hope, with the latter showing signs of developing into what may be a rather large field.

From the standpoint of reserves, the East Texas field operation has developed into such a scientific technique of producing enormous quantities of oil with such small decline in pressure that many companies have revised their proven reserve estimates upward by substantial amounts.

NORTH AND WEST CENTRAL TEXAS

Widespread wildcatting activity during 1944 resulted in many small discoveries, but on the whole the returns for the district are considered poor. Of the 412 wildcats completed, only 155 were carried below 4,000 ft.

Further development of the Hildreth pool in Montague County added most of the new production for 1944. An intensification of wildcatting in Cooke and adjacent counties, and in the large virgin territory around the Ohio Oil Co.'s King County strike is anticipated.

PANHANDLE TEXAS

Except for expansion of gas fields in Hansford and Sherman counties, no new producing areas were opened during the year. Intensive drilling in old fields sustained production within 10 per cent of 1943 output. There were no important extensions during the year.

PERMIAN BASIN

Pre-Permian exploration, although costly and slow, resulted in important additions to crude reserves from Devonian lime in Andrews, Crane and Ector counties. Exploration in the deep Wheeler and Keystone Ellenburger fields proved the existence of multiple pay zones at some locations, and Ellenburger was established as a source of future production in the Todd Deep field in Crockett County. Although not currently produced, some estimates of future potential recovery at Todd, run as high as 50,000 bbl. per acre.

The productive limits of the basin were pushed about 30 miles northward into Lamb County by Humble Oil & Refining Co.'s lower Permian producer. The Holt and McKnight pays established valuable new reserves in Crane and Winkler counties. The Fullerton and Union pools, producing from Clear Fork, continued to expand and the Mascho-Fuhrman and Mabee pools were developed into large areas. The Slaughter field and adjacent producing areas in Cochran and Hockley counties also grew larger.

SOUTHEAST NEW MEXICO

The last half of 1944 saw an upward turn in this territory's producing possibilities, with important upper Permian production found in the Turner area of Lea County, and lower Permian pay found by Gulf Oil Corp. 1 Drinkard, on the east flank of the Penrose field. Intensive development was started in both areas.

Humble Oil & Refining Co. in an 11,000-ft. test, found Ellenburger production extending into southeast Lea County. Continental Oil Co. opened a deep pay in the Monument area and the Cockburn well in western Lea County had a good showing of oil in the lower Permian. If transportation outlets encourage more drilling in 1945, it is anticipated that further developments around these new discoveries will add substantially to the proven reserves next year.

SOUTH TEXAS

Although there were 13 new oil fields opened, none indicated promise of being substantial at the end of the year. Additional developments during 1945 are expected to reverse this prospect in at least one or two cases. A new deep pay was opened at East Alta Mesa while the Scott and Hopper field of Brooks County continued to expand rather slowly. The potential reserve of Scott and Hopper is rated much higher than the proven reserve.

GULF COAST

There were 42 new fields opened on the Upper and Lower Gulf Coast during 1944 and some of them will undoubtedly develop into important reserves with additional drilling. During the year, much attention was given to prospecting flanks of older fields as well as exploration for deeper producing horizons. An outstanding example was the development of Wilcox production in the Livingston pool of Polk County, leading to the opening of several new producers from the Sparta sand in that field. Another is the extension of the Fannett and Lovell Lake fields in Jefferson County, with important production also opened on the southwest flank of the Blue Ridge field in Fort Bend County.

Of particular interest was the discovery of five new Cockfield sand areas along a trend thought to be fairly well worked in former years, although none seems of great importance to reserves.

SOUTHERN LOUISIANA

Exploration during 1944 resulted in the discovery of 13 new fields, including opening of the first commercial production on the Bayou des Glaise dome in Iberville Parish. With the exception of the Gordon field in Beauregard Parish, North Cankton in St. Landry, Good Hope in St. Charles, and West Tepetate in Jefferson Davis Parish, very few of the new discoveries have received much development drilling.

The two producers at West Tepetate each opened a different pay horizon, yielding high potential on initial gages, and it may prove to be the major discovery of the year. The Pine Prairie dome continues to expand in importance with production now obtained on almost all flanks. The West Gueydan field proved productive on the southeast flank.

Exploratory and Development Drilling—Where It Occurred and the Results

CALIFORNIA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	1	1	12	65,557
February	10	1	1	8	34,700
March	11	0	0	11	52,512
April	22	0	1	21	112,567
May	17	4	0	13	80,667
June	36	2	0	34	155,575
July	30	3	0	27	128,017
August	10	1	0	9	76,220
September	16	2	2	12	84,540
October	17	0	1	16	85,786
November	11	1	0	10	40,556
December	20	0	1	19	78,960
Total	214	15	7	192	995,657

CALIFORNIA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	134	121	2	11	434,487
February	134	125	3	6	433,033
March	146	135	2	9	521,550
April	160	146	1	13	546,570
May	141	126	4	11	503,404
June	146	134	2	10	509,158
July	159	140	4	15	696,759
August	152	140	3	9	472,477
September	177	163	7	7	622,880
October	167	154	2	11	584,408
November	142	124	4	14	567,163
December	162	140	7	15	639,650
Total	1,820	1,648	41	131	6,531,539

CALIFORNIA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	148	122	3	23	500,044
February	144	126	4	14	467,733
March	157	135	2	20	574,062
April	182	146	2	34	659,137
May	158	130	4	24	584,071
June	182	136	2	44	664,733
July	189	143	4	42	824,776
August	162	141	3	18	548,697
September	193	165	9	19	707,420
October	184	154	3	27	670,194
November	153	125	4	24	607,719
December	182	140	8	34	718,610
Total	2,034	1,663	48	323	7,527,196

CALIFORNIA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Antelope Hills	8	8	0	0	2,044
Ant Hill	3	3	0	0	351
Aliso Canyon	8	8	0	0	7,654
Bellevue	5	3	0	2	3,257
Belridge, North	4	4	0	0	3,372
Belridge, South	201	199	0	2	8,378
Blackwells Cor.	16	16	0	0	637
Brea Olinda	7	7	0	0	1,409
Buena Vista Hills	72	67	0	5	28,988
Burrel	3	1	0	2	100
Coalinga, East	96	94	0	2	8,321
Coalinga Nose	4	4	0	0	3,630
Coalinga, West	58	56	1	1	4,082
Coles Levee	9	8	1	0	4,066
Coyote, East	12	12	0	0	1,030
Coyote, West	20	20	0	0	9,100
Del Valle	4	4	0	0	2,630
Dominguez	10	10	0	0	6,977
Edison	28	24	0	4	2,084
Elk Hills	104	103	0	1	34,161
El Segundo	3	2	0	1	375
Elwood	3	3	0	0	835
Fruitvale	23	22	1	0	1,879
Gato Ridge	5	4	0	1	1,294
Goleta	2	0	2	0	0
Gosford	2	2	0	0	1,210
Greeley	10	7	0	3	6,003
Hamilton City	4	0	3	1	0
Helm	18	18	0	0	3,258
Huntington Beach	73	71	0	2	13,815
Inglewood	6	6	0	0	1,216
Jacalitos	13	10	1	2	2,932
Kern Front	85	80	0	5	6,233
Kern River	31	30	0	1	1,177
Kettleman North Dome	13	13	0	0	5,958
Long Beach	9	6	0	3	381
McClung	3	0	0	3	0
McKittrick	38	32	0	6	2,178
Mendota	3	0	3	0	0
Midway-Sunset	155	138	3	14	11,352
Montebello	10	10	0	0	910
Mountain View	7	4	1	2	616
Mount Poso	39	26	0	13	1,461
Newhall Potrero	5	5	0	0	1,401
Oak Canyon	4	2	0	2	387
Padre Canyon	4	4	0	0	2,085
Paloma	15	15	0	0	8,633
Pleasant Valley	11	11	0	0	7,186
Pyramid Hills	13	12	0	1	634
Race Track	2	2	0	0	223
Raisin City, West	16	13	2	1	3,265
Richfield	7	7	0	0	636
Rincon	15	14	0	1	3,566
Rio Vista	16	0	11	5	0
Riverdale	21	19	0	2	6,492
Rosecrans	5	5	0	0	811
Round Mountain	25	15	0	10	1,409
San Martinez	9	7	0	2	2,629
San Miguelito	5	5	0	0	5,737
Santa Maria	26	20	0	6	4,214
Santa Maria Valley	87	85	1	1	21,248
Seal Beach	7	7	0	0	7,027
Sheep Springs	5	2	0	3	340
Strand, East	3	3	0	0	3,049
Strand, West	2	2	0	0	654
Suisun	2	0	2	0	0
Tejon	10	5	0	5	481
Thornton	2	0	2	0	0
Torrance	32	32	0	0	3,457
Ventura Ave.	30	30	0	0	30,866
Ventura-Newhall	41	32	0	9	4,549
Whittier Hgts.	5	2	0	3	62
Wilmington	145	144	1	0	27,635
Yorba Linda	3	3	0	0	392
Miscellaneous	20	10	6	4	77
Wildcats	214	15	7	192	1,736
Total	2,034	1,663	48	323	346,235

CALIFORNIA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Butte	4	0	1	3	18,828
Colusa	4	0	0	4	16,138
Contra Costa	4	0	0	4	18,584
Fresno	18	1	0	17	127,909
Glenn	2	0	1	1	6,413
Humboldt	1	0	0	1	2,843
Imperial	3	0	0	3	12,046
Kern	91	12	0	79	351,596
Kings	3	0	1	2	18,616
Los Angeles	26	2	0	24	138,584
Madera	1	0	0	1	3,996
Merced	2	0	0	2	9,534
Orange	11	0	0	11	52,381
Sacramento	2	0	0	2	4,465
San Diego	1	0	0	1	3,751
San Joaquin	6	0	0	6	40,230
San Mateo	3	0	0	3	9,763
San Luis Obispo	1	0	0	1	3,050
Santa Barbara	6	0	0	6	25,152
Solano	7	0	3	4	45,060
Sonoma	1	0	0	1	1,506
Tehama	6	0	1	5	25,412
Tulare	4	0	0	4	10,743
Ventura	6	0	0	6	43,703
Yolo	1	0	0	1	5,354
Total	214	15	7	192	995,657

MONTANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	1,926
February	0	0	0	0	0
March	0	0	0	0	0
April	3	0	1	2	9,391
May	3	0	0	3	6,414
June	8	1	0	7	21,218
July	6	0	0	6	15,110
August	11	1	1	9	24,824
September	6	0	1	5	13,682
October	10	0	1	9	27,452
November	5	1	0	4	16,860
December	10	1	1	8	38,008
Total	63	4	5	54	174,885

MONTANA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	30	23	1	6	73,900
February	17	11	1	5	42,149
March	18	16	0	2	46,629
April	22	19	0	3	51,154
May	23	16	0	7	58,530
June	37	23	8	6	92,472
July	29	18	5	6	68,088
August	45	31	13	1	103,198
September	30	18	2	10	83,787
October	23	21	0	2	48,413
November	10	8	2	0	25,144
December	40	13	26	1	78,083
Total	324	217	58	49	771,547

MONTANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	31	23	1	7	75,826
February	17	11	1	5	42,149
March	18	16	0	2	46,629
April	25	19	1	5	60,545
May	26	16	0	10	64,944
June	45	24	8	13	113,690
July	35	18	5	12	83,198
August	56	32	14	10	128,022
September	36	18	3	15	97,469
October	33	21	1	11	75,865
November	15	9	2	4	42,004
December	50	14	27	9	116,091
Total	387	221	63	103	946,432

MONTANA
Total Completions by Fields
(Including Wildcats)

Field—	Comp.	Oil	Gas	Dry	Prod.
Agawan	1	0	0	1	0
Ashmoor	1	0	0	1	0
Bowdoin	32	0	32	0	0
Brady	2	0	0	2	0
Cedar Creek	18	0	15	3	0
Clark's Fork	1	1	0	0	200
Collins	2	0	0	2	0
Conrad Butte	1	0	0	1	0
Cordova	1	0	0	1	0
Crooked Creek	1	0	0	1	0
Custer	1	0	0	1	0
Cut Bank	136	101	7	28	8,907
Dry Creek	1	1	0	0	300
Dunkirk	1	0	1	0	0
East Utopia	1	0	1	0	0
East Van	1	0	0	1	0
Elk Basin	10	10	0	0	7,280
Farmington	4	1	0	3	10
Gage	9	4	0	5	3,150

BAASH TOOL CO

Baash-Ross News

HOUSTON · NEW YORK

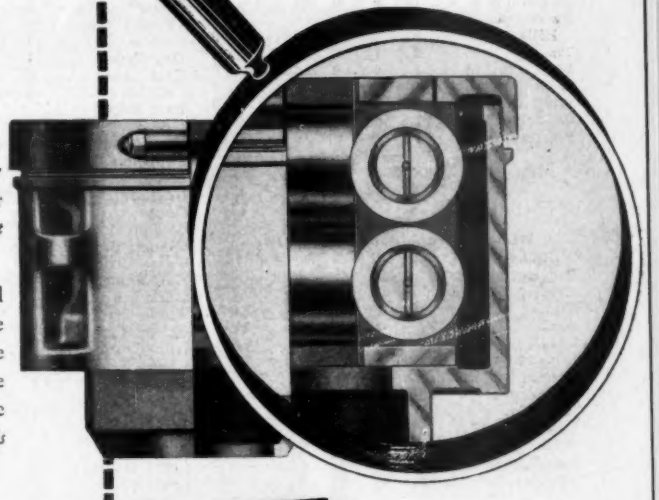
OUR 25th YEAR

What happens WHEN A KELLY DRIVE BUSHING Drives?

Did you ever stop to think that your kelly bushing serves two basic purposes on your drilling rig . . . *and that these two objectives are in direct opposition to one another?*

The kelly bushing (1) drives or rotates the drill string, and (2) permits the drill string to feed through the table while being rotated. Yet the harder the bushing pushes against the string to drive it, the more friction is set up and the more difficult it becomes for the kelly to feed freely *through* the bushing . . . *unless some means is provided of reducing this friction.*

Make the experiment outlined below and you'll see why...



The BAASH-ROSS Roller Kelly Bushing

means smoother bit control, greater drilling efficiency

Try this simple test: Place your hand flat on a smooth surface and push it away from you. Then press harder and push . . . and harder still and push again. Note how quickly increased pressure builds up friction between your hand and the surface until it soon becomes very difficult to move your hand smoothly over the surface. Instead, it tends to move in sudden jerks.

That's exactly what happens in the conventional flat-surfaced kelly bushing. When the string is rotating idly with no load, the kelly feeds easily through just as your hand moves smoothly when there is no pressure. But as the bushing drives the kelly faster and faster, driving pressure between bushing and kelly surfaces rapidly pyramids until smooth kelly feed is no longer possible. It becomes jumpy and erratic, which throws sudden torsional strains into the drill string, increasing the risk of twist-offs . . . puts destructive surging loads on table and swivel bearings . . . shortens the footage you get from your drilling bits . . and substantially reduces the life of other rig equipment.

What's the solution? Going back to the hand test, try this: Put two ordinary round lead pencils between your hand and the flat surface and try the same experiment over again. Notice that—*no matter how hard you press down*—the two pencils eliminate friction to such an extent that your hand always moves freely and effortlessly.

And that's exactly how the Baash-Ross Roller Kelly Bushing increases drilling efficiency! By using *rollers* instead of flat drive surfaces between kelly and bushing, the Roller Kelly Bushing permits free effortless kelly feed at all times regardless of the driving pressure of rotating the string. Bit feed becomes smooth and controlled at all table speeds!

What this all adds up to . . . Because it uses *rollers* instead of flat sliding surfaces, the Baash-Ross Roller Kelly Bushing provides an accuracy of bit control *unobtainable with any other type of bushing.* This smooth accurate feed greatly increases bit footage . . . reduces strain on the drill string . . . lengthens equipment life . . . and insures greater all-around drilling efficiency wtih less equipment maintenance.

It means **Straighter Hole** because the weight is under instant, accurate control at all times. It means **Far Better Coring** because the smooth steady feed minimizes premature dulling of core bits, break-up of cores, and jamming of barrels. It means **Fewer Fishing Jobs** because the sudden torsional strains that damage drill string connections are minimized. And it means **Less Bushing Maintenance** because, in contrast to conventional kelly bushings, maintenance of Baash-Ross Roller Bushing is unusually simple—just periodic lubrication through easily-reached grease nipples.

Baash-Ross Roller Kelly Bushings are available in sizes to fit all square kellys 2½" to 6" . . . all hex kellys 3" to 7". See your nearest Baash-Ross representative for complete detdils, refer to page 256 of your Composite Catalog, or write direct.

Field—	Comp.	Oil	Gas	Dry	Prod.
Hagen	1	0	0	1	0
Hardin	1	0	0	1	0
High Gravity	12	11	0	1	6,061
Ingomar	1	0	0	1	0
Keith	1	0	0	1	0
Kevin-Sunburst	113	87	4	22	4,195
Kicking Horse	2	0	2	0	0
Ledger	1	0	0	1	0
Marias	1	0	0	1	0
McLeod	1	0	0	1	0
Meriwether	1	0	0	1	0
Midway	14	2	1	11	25
Pendroy	1	0	0	1	0
Pondera	2	1	0	1	10
Pondera Block	1	0	0	1	0
Prescott	1	0	0	1	0
Sterrenberry	1	0	0	1	0
Sweetgrass Hills	1	0	0	1	0
Thorpe	2	1	0	1	25
West Conrad	1	0	0	1	0
West Pendroy	1	0	0	1	0
West Pondera	1	0	0	1	0
West Utopia	1	0	0	1	0
Whillash	1	1	0	0	20
Total	387	221	83	103	30,273

MONTANA

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Big Horn	1	0	0	1	1,165
Carbon	3	2	1	0	19,578
Choteau	1	0	0	1	2,068
Fallon	1	0	0	1	2,310
Glacier	2	0	0	2	9,392
Liberty	3	0	1	2	8,383
Musselshell	3	1	0	2	18,548
Pondera	23	1	1	21	45,599
Rosebud	1	0	0	1	5,907
Teton	10	0	0	10	21,417
Toole	11	0	2	9	18,038
Sweetgrass	1	0	0	1	2,992
Yellowstone	3	0	0	3	19,488
Total	63	4	5	54	174,885

WYOMING

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	13,669
February	5	3	0	2	15,608
March	3	1	0	2	13,786
April	2	2	0	0	11,734
May	3	1	0	2	16,916
June	4	3	1	0	23,471
July	3	0	0	3	13,033
August	5	2	0	3	19,028
September	4	1	0	3	18,915
October	5	3	1	1	15,390
November	10	3	0	7	44,311
December	7	4	0	3	37,267
Total	53	23	2	28	243,128

WYOMING

Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	13	13	0	0	56,389
February	7	7	0	0	28,357
March	13	13	0	0	60,324
April	13	13	0	0	65,563
May	14	13	0	1	57,911
June	13	10	0	3	51,552
July	12	12	0	0	55,510
August	13	13	0	0	54,512
September	15	13	1	1	62,441
October	14	13	1	0	71,802
November	5	5	0	0	22,630
December	20	19	1	0	76,623
Total	152	144	3	5	663,614

WYOMING

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	15	13	0	2	70,058
February	12	10	0	2	43,965
March	16	14	0	2	74,110
April	15	15	0	0	77,297
May	17	14	0	3	74,827
June	17	13	1	3	75,023
July	15	12	0	3	68,543
August	18	15	0	3	73,540
September	19	14	1	4	81,356
October	19	16	2	1	87,192
November	15	8	0	7	66,941
December	27	23	1	3	113,890
Total	205	167	5	33	906,742

WYOMING

Total Completions by Fields (Including Wildcats)

Field—	Comp.	Oil	Gas	Dry	Prod.
Alkali	1	0	0	1	0
Barren Butte	1	0	0	1	0
Belle Springs	1	0	1	0	0
Big Muddy	4	4	0	0	1,512
Byron	10	10	0	0	2,770
Canyon Creek	1	0	0	1	0
Cole Creek	5	5	0	0	912
Cooper Cove	3	2	0	1	351
Crook's Gap	1	1	0	0	1,487
Dallas	1	0	0	1	0
Dry Creek	1	0	0	1	0
East Lance Creek	3	2	0	1	720
East Rock River	1	0	0	1	0
Elk Basin	47	46	0	1	49,762
Fourbear	1	1	0	0	400
Frannie	5	4	0	1	1,282
Garland	13	10	0	3	2,368
Gebo	2	2	0	0	3,325
Glendo	1	0	0	1	0
Golden Eagle	1	1	0	0	480
Grass Creek	4	4	0	0	437
Half Moon	1	1	0	0	840
Hamilton	1	1	0	0	120
Horse Creek	2	2	0	0	45
Horse Center	1	0	0	1	0
Iron Creek	1	0	0	1	0
Kirby Creek	1	1	0	0	150
Lance Creek	8	7	0	1	1,266
Little Buck Creek	1	0	0	1	0
Little Buffalo Basin	6	4	0	2	2,748
Little Dome	2	0	0	2	0
Little Grass Creek	1	0	1	0	0
Lost Soldier	9	8	0	1	6,948
Mahoney	1	1	0	0	100
Mush Creek	1	1	0	0	80
N. Big Hollow	2	2	0	0	200
Notches	1	1	0	0	90
Oregon Basin	36	33	0	3	4,444
Pitchfork	1	1	0	0	229
Poison Spider	1	0	0	1	0
Powder River	1	0	0	1	0
Salt Creek	1	1	0	0	164
Shawnee	1	0	0	1	0
South Baxter Basin	3	0	3	0	0
South Sunshine	1	1	0	0	18
Spence	1	1	0	0	60
Spindletop	1	1	0	0	320
Spring Creek	1	0	0	1	0
Steamboat Butte	3	3	0	0	1,580
Two Bar	1	0	0	1	0
Wagonhound	1	1	0	0	497
West Rawlins	1	0	0	1	0
Winkelman	5	4	0	1	2,260
Total	205	167	5	33	87,970

WYOMING

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Albany	2	1	0	1	3,853
Big Horn	5	2	0	3	62,151
Carbon	5	2	1	2	19,938
Converse	1	0	0	1	4,860
Fremont	11	4	0	7	37,589
Hot Springs	5	4	1	0	27,638
Natrona	4	1	0	3	14,166
Niobrara	5	2	0	3	17,526
Platte	1	0	0	1	1,335
Park	12	7	0	5	46,345
Sweetwater	2	0	0	2	7,727
Total	53	23	2	28	243,128

COLORADO

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	4,861
February	2	1	0	1	8,760
March	0	0	0	0	0
April	0	0	0	0	0

Vapor recovery and fractionating plant in an East Coast refinery, designed and constructed by *Petroleum Engineering, Inc. Offices: Tulsa and Houston.*

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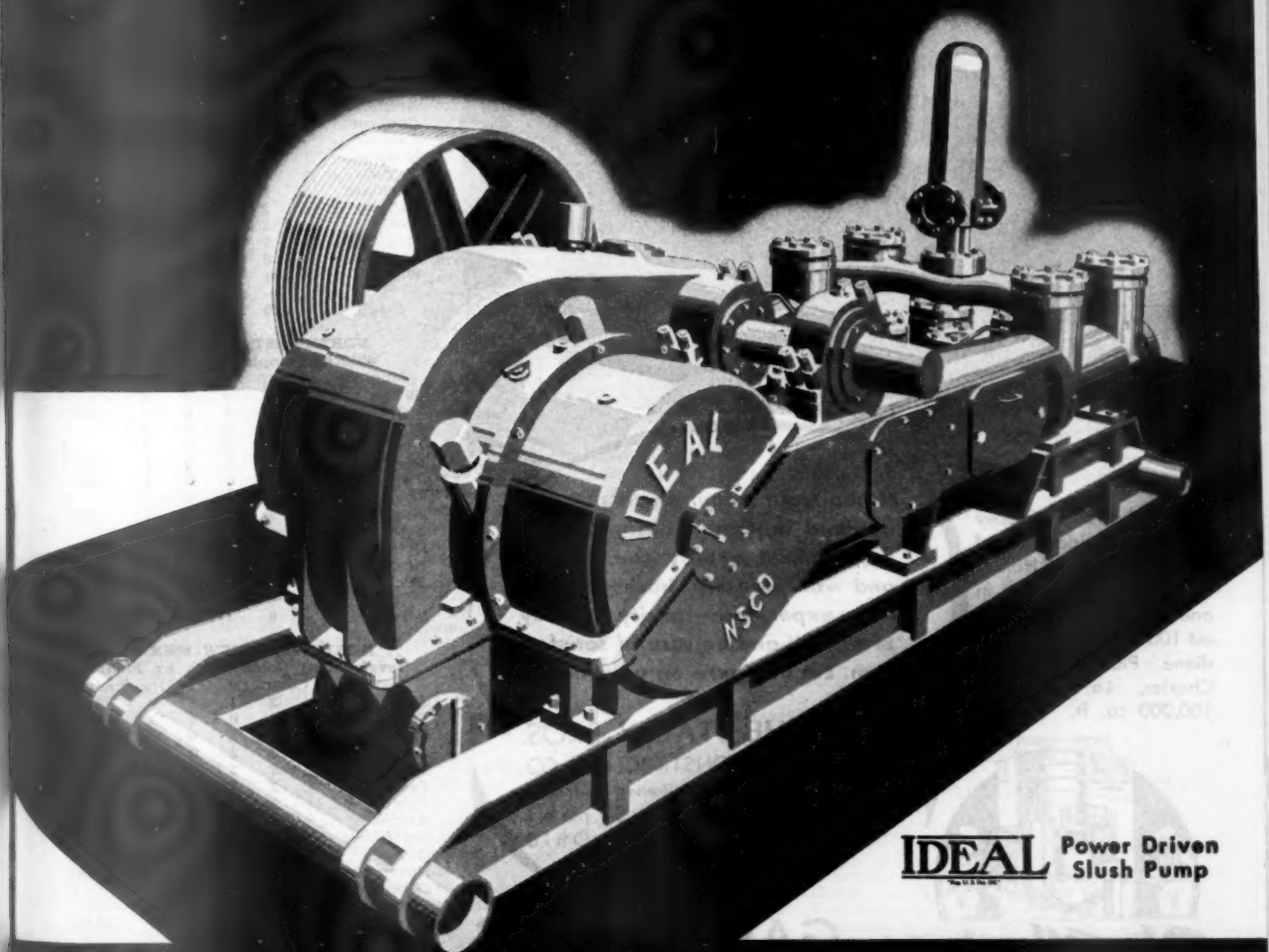
for all Rotary Drilling Requirements

The particular requirements of your location . . . drilling conditions . . . and time schedules . . . can be met adequately from National's line of nine IDEAL Slush Pump models. They are engineered with a background of skill and experience, to deliver an extra measure of profitable service to you.



IDEAL Power Driven Slush Pump

General Sales Offices: Toledo, Ohio: Division Offices: Denver; Ft. Worth; Pittsburgh; Tulsa; Torrance.
Export: The National Supply Corporation, 30 Rockefeller Plaza, New York, N. Y., U. S. A.,
River Plate House, 12 South Place, London, E. C. 2.

Month—	Comp.	Oil	Gas	Dry	Footage
May	2	1	0	1	13,830
June	1	0	0	1	3,005
July	0	0	0	0	0
August	1	0	1	0	7,005
September	3	1	0	2	16,792
October	1	0	0	1	2,035
November	1	0	0	1	9,084
December	7	4	0	3	32,463
Total	19	7	1	11	97,835

Month—	Comp.	Oil	Gas	Dry	Footage
May	0	0	0	0	0
June	1	1	0	0	6,605
July	3	3	0	0	18,231
August	3	2	0	1	16,900
September	3	3	0	0	19,840
October	0	0	0	0	0
November	1	1	0	0	5,590
December	0	0	0	0	0
Total	17	15	0	2	97,273

COLORADO
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	1	0	0	3,454
February	3	2	0	1	13,651
March	1	1	0	0	6,974
April	1	1	0	0	6,028

COLORADO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	1	0	1	8,315
February	5	3	0	2	22,411
March	1	1	0	0	6,974
April	1	1	0	0	6,028

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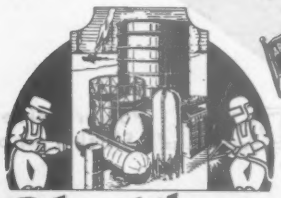

Stacey Brothers

GAS HOLDERS
SCRUBBERS • TOWERS • OIL TANKS

ENGINEERS • FABRICATORS • RECOGNIZED EXPERIENCE & FACILITIES

Month—	Comp.	Oil	Gas	Dry	Footage
May	2	1	0	1	13,830
June	2	1	0	1	9,610
July	3	3	0	0	18,231
August	4	2	1	1	23,905
September	6	4	0	2	36,632
October	1	0	0	1	2,035
November	2	1	0	1	14,674
December	7	4	0	3	32,463
Total	36	22	1	13	195,108

COLORADO
Total Completions by Fields
(Including Wildcats)

Field—	Comp.	Oil	Gas	Dry	Prod.
Bell Rock	1	0	1	0	0
Boone	1	0	0	1	0
Chromo	1	0	0	1	0
Clark's Lake	5	5	0	0	578
Hardin	1	0	0	1	0
Iles	2	2	0	0	97
Kit Carson	1	0	0	1	0
McElmo	1	0	0	1	0
N. Fort Collins	1	1	0	0	75
N. McCallum	5	5	0	0	1,134
Pagosa	1	0	0	1	0
Powder Wash	2	1	0	1	480
Rangely	3	3	0	0	992
Red Mesa	1	0	0	1	0
Sand Creek	1	0	0	1	0
St. Mary's	1	0	0	1	0
S. McCallum	1	0	0	1	0
Webster Hill	1	0	0	1	0
White River	1	0	0	1	0
Wilson Creek	5	5	0	0	3,448
Total	36	22	1	13	6,804

COLORADO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Archuleta	3	0	0	3	4,825
Cheyenne	1	0	0	1	4,861
Garfield	1	0	0	1	3,600
Huerfano	1	0	0	1	1,250
Jackson	3	3	0	0	18,013
La Plata	1	0	0	1	3,005
Larimer	3	2	1	0	18,225
Moffat	1	0	0	1	9,084
Montezuma	1	0	0	1	7,046
Rio Blanco	3	2	0	1	19,941
Weld	1	0	0	1	7,985
Total	19	7	1	1	97,835

NORTHWEST NEW MEXICO
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	0	0	0	0	0
February	1	0	0	1	1,106
March	0	0	0	0	0
April	0	0	0	0	0
May	1	0	0	1	2,402
June	2	0	0	2	2,953
July	0	0	0	0	0
August	1	0	0	1	1,231
September	0	0	0	0	0
October	0	0	0	0	0
November	0	0	0	0	0
December	1	0	0	1	880
Total	6	0	0	6	8,572

NORTHWEST NEW MEXICO
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	1	1	0	1,516
February	2	0	1	1	3,362
March	1	1	0	0	727
April	2	2	0	0	2,703
May	5	3	2	0	8,659
June	2	2	0	0	2,197
July	2	0	1	1	3,344
August	3	2	0	1	3,044
September	0	0	0	0	0
October	3	2	1	0	5,479
November	1	1	0	0	1,561
December	0	0	0	0	0
Total	23	14	6	3	32,592

NORTHWEST NEW MEXICO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	1	1	0	1,516
February	3	0	1	2	4,468
March	1	1	0	0	727

Month—	Comp.	Oil	Gas	Dry	Footage
April	2	2	0	0	2,703
May	6	3	2	1	11,061
June	4	2	0	2	5,150
July	2	0	1	1	3,344
August	4	2	0	2	4,275
September	0	0	0	0	0
October	3	2	1	0	5,479
November	1	1	0	0	1,561
December	1	0	0	1	880
Total	29	14	6	9	41,164

NORTHWEST NEW MEXICO
Total Completions by Fields
(Includes Wildcats)

Field—	Comp.	Oil	Gas	Dry	Prod.
Barker	3	0	3	0	0
Buffalo	1	0	0	1	0
Fulcher Basin	4	0	2	2	0
Hospah	8	8	0	0	537
Palma	1	0	0	1	0
Rattlesnake	8	4	1	3	200
Red Mountain	3	2	0	1	18
Willow Creek	1	0	0	1	0
Total	29	14	6	9	755

NORTHWEST NEW MEXICO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
McKinley	1	0	0	1	502
Rio Arriba	1	0	0	1	880
San Juan	2	0	0	2	3,558
San Miguel	1	0	0	1	880
Torrance	1	0	0	1	2,402
Total	6	0	0	6	8,572

TEXAS PANHANDLE
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	6,756
February	1	0	0	1	6,114
March	0	0	0	0	0
April	0	0	0	0	0
May	1	0	0	1	3,355
June	0	0	0	0	0
July	0	0	0	0	0
August	3	0	1	2	13,300
September	1	0	1	0	3,424
October	1	0	0	1	7,279
November	0	0	0	0	0
December	2	0	1	1	5,840
Total	10	0	3	7	46,068

TEXAS PANHANDLE
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	8	7	0	1	24,200
February	12	9	0	3	36,974
March	14	10	0	4	41,688
April	19	17	0	2	60,197
May	22	19	0	3	69,140
June	19	17	1	1	58,635
July	29	24	2	3	92,006
August	25	21	3	1	77,642
September	40	28	9	3	125,487
October	34	28	4	2	107,342
November	36	22	9	5	107,336
December	44	25	16	3	137,137
Total	302	227	44	31	937,784

TEXAS PANHANDLE
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	9	7	0	2	30,956
February	13	9	0	4	43,088
March	14	10	0	4	41,688
April	19	17	0	2	60,197
May	23	19	0	4	72,495
June	19	17	1	1	58,635
July	29	24	2	3	92,006
August	28	21	4	3	90,942
September	41	28	10	3	128,911
October	35	28	4	3	114,621
November	36	22	9	5	107,336
December	46	25	17	4	142,977
Total	312	227	47	38	983,852

TEXAS PANHANDLE
Development Completions by Counties

County—	Total	Oil	Gas	Dry	Prod.
Carson	51	42	9	0	8,280
Gray	109	95	0	14	13,188
Hansford	8	0	8	0	0
Hartley	6	0	6	0	0
Hutchinson	96	87	1	8	10,473
Moore	19	0	17	2	0
Sherman	7	0	1	6	0
Wheeler	6	3	2	1	115
Wildcats	10	0	3	7	0
Total	312	227	47	38	32,056

TEXAS PANHANDLE
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Dallam	1	0	0	1	6,779
Donley	2	0	0	2	10,111
Floyd	1	0	0	1	5,500
Gray	2	0	1	1	6,061
Hansford	1	0	1	0	2,944
Hutchinson	1	0	0	1	3,320
Moore	1	0	1	0	3,424
Oldham	1	0	0	1	7,929
Total	10	0	3	7	46,068

WEST TEXAS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	2	0	12	75,655
February	11	2	0	9	61,808
March	7	1	0	6	43,338
April	28	5	1	22	140,375
May	14	2	0	12	76,886
June	26	3	1	22	143,252
July	7	1	0	6	43,359
August	19	2	0	17	64,239
September	20	10	0	10	97,848
October	16	3	0	13	94,365
November	12	1	0	11	47,124
December	14	2	0	12	75,395
Total	188	34	2	152	963,644

WEST TEXAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	90	82	0	8	354,577
February	130	120	0	10	579,750
March	119	108	0	11	520,131
April	111	107	0	4	507,298
May	142	128	1	13	655,236
June	90	83	2	5	418,147
July	84	79	1	4	398,337
August	113	105	1	7	534,599
September	122	114	3	5	590,441
October	115	107	0	8	717,414
November	125	113	4	8	596,101
December	153	143	1	9	736,759
Total	1,394	1,289	13	92	6,608,790

WEST TEXAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	104	84	0	20	430,232
February	141	122	0	19	641,556
March	126	109	0	17	563,469
April	139	112	1	26	647,673
May	156	130	1	25	732,122
June	116	86	3	27	561,399
July	91	80	1	10	441,696
August	132	107	1	24	598,838
September	142	124	3	15	688,289
October	131	116	0	21	811,779
November	137	114	4	19	643,225
December	167	145	1	21	812,154
Total	1,582	1,323	15	244	7,572,434

WEST TEXAS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Abell	4	3	0	1	569
Apco-Warner	7	5	1	1	3,877
Apco-1600	7	6	0	1	410
Barnhart	12	12	0	0	32,393
Big Lake	2	0	0	2	0
Cedar Lake	3	3	0	0	750
Chancellor	2	0	0	2	0
Clara Couch	7	2	1	4	78
Cowden, N.	75	75	0	0	16,592
Cowden, S.	4	3	0	1	221
Crockett	3	3	0	0	125
Crossett	4	4	0	0	1,173
Dean	5	4	0	1	529
Dune	5	3	0	2	299
Eaves	13	11	0	2	2,250
Embar	2	2	0	0	264
Permian	2	2	0	0	264
Embar Ellen	4	3	0	1	2,840
Emma	4	2	0	2	1,493
Emperor	6	6	0	0	2,273
Estes	5	5	0	0	2,119
Foster	2	2	0	0	341
Ft. Stockton	4	4	0	0	223
Fuhrman-Masco	58	58	0	0	15,070
Fullerton	114	114	0	0	93,489
Funk	7	7	0	0	325
Goldsmith	17	17	0	0	13,490
Halley	16	16	0	0	5,151
Herrington	3	1	0	2	114
Howard-Glasscock	16	13	0	3	3,149
Iatan-E. Howard	35	31	0	4	5,436
Iatan N.	6	5	0	1	697
Keystone Colby	15	14	1	0	2,206
Keystone Ellen.	12	11	0	1	20,101
Keystone Holt	3	2	1	0	877
Keystone Lime	8	8	0	0	1,390
Leck	2	2	0	0	299
Lehn	4	3	0	1	90
Mabee	27	27	0	0	4,778
McCamey	3	2	0	1	425
McElroy	20	19	0	1	7,452
McKee	3	1	0	2	235
Means	7	7	0	0	1,542
Monahans	2	2	0	0	1,337
Monahans, N.	4	3	0	1	596
Moore	11	10	0	1	286
Morita	3	3	0	0	79
Noelke	10	6	1	3	1,220
Olson	10	8	0	2	617
Ownby	14	13	0	1	3,366
P-H-D	3	1	0	2	131
Sand Hills Ordovician	6	5	0	1	12,075
Sand Hills McKnight	3	3	0	0	15,402
Sand Hills Tubb	41	41	0	0	39,561
Shannon	6	4	1	1	839
Seminole	26	23	0	3	5,052
Sharon Ridge	7	6	0	1	476
Shipley	3	1	0	2	72
Slaughter	381	372	0	9	248,513
Smyer	3	3	0	0	355
Taylor-Link	5	3	0	2	431
Tobord	3	1	0	2	30
Todd Deep	6	6	0	0	9,211
Union	10	10	0	0	5,593
Vincent	2	2	0	0	153
Waddell	15	15	0	0	19,000
Walker	3	3	0	0	266
Waples Platter	8	7	0	1	702
Ward, N.	47	46	0	1	19,249
Ward, S.	2	2	0	0	39
Wasson	60	58	0	2	18,678
Wasson Deep	4	3	0	1	329
Wasson 72	5	5	0	0	1,091
Weiner	19	17	0	2	3,376
Wentz	2	0	0	2	0
Westbrook	52	51	0	1	3,852
Wheeler	7	7	0	0	8,149
White & Baker	9	5	2	2	305
World	3	3	0	0	199
Yates	17	13	0	4	2,950
Yellowhouse	2	2	0	0	175
Miscellaneous	24	10	5	9	532
Wildcats	188	34	2	152	9,794
Total	1,582	1,323	15	244	679,216

WEST TEXAS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Andrews	14	5	0	9	128,640
Borden	1	0	0	1	3,346
Brewster	1	0	0	1	1,261
Cochran	6	4	0	2	29,794
Coke	1	0	0	1	6,425
Conchoe	2	0	0	2	6,538
Crane	9	3	0	6	49,375
Crockett	6	0	0	6	27,378
Culberson	2	0	0	2	5,992
Dawson	6	0	0	6	39,129
Dickens	3	0	0	3	14,750
Ector	4	0	0	4	27,644
Gaines	13	1	1	11	100,672
Garza	4	1	0	3	14,142
Glasscock	2	0	0	2	9,233
Hale	1	0	0	1	10,250

There's SECURITY in every KENNEDY VALVE DESIGN

Security of operation . . . because the simple, sturdy, effective operating mechanism of these valves assures tight closure, prompt release on the first opening motion, and easy operation

Security against trouble . . . because the efficient design and heavy proportions of every part of these valves provide a more-than-generous margin of strength at rated pressures

Security of economy . . . because the long life and minimum maintenance expense of these valves have been proven in refineries, oil and gas fields, pump houses and high pressure oil and gas pipe lines all over the country.

You are SECURE when you install Kennedy Valves. For full description of their many advantageous features, write for the 240-page Kennedy Catalog.

THE KENNEDY VALVE MFG. CO. . . . . ELMIRA, N. Y.

KENNEDY

Extra Values in VALVES and PIPE FITTINGS

SPERRY-SUN

Cuts Survey Time In Half

E EA-SY **C**

INCLINOMETER

Now widely accepted by drillers as an outstanding device for surveying bore holes.

The most simple, easiest to operate and speediest inclination recorder. Operated by dry cell batteries on electro-chemical principles. Self-checking. Low in rental charge and operating cost.

Operates on measuring or wire line. Multiple recording can be made with one round trip in the hole. Detailed information on request.

SPERRY-SUN WELL SURVEYING CO.
PHILADELPHIA, PA.

You Need This Combination

WHERE ENGINES RUN HOT!

In oil field engines, the extreme heats generated by gas fuel place a heavy burden on valve stems, piston rings and cylinder walls. Critical top cylinder areas do not receive even the small benefit of the scant lubricating value in liquid fuels. That's why the use of Marvel Mystery Oil with the Marvel Inverse Oiler has become standard practice wherever gas fueled engines are in service. For, where ordinary lubricants lose their function and normal film strength breaks down, Marvel Mystery Oil sustains its remarkable efficiency.

The Marvel Inverse Oiler proportions the flow of Marvel Mystery Oil precisely to the needs of the engine. Its cost is low and installation simple. Ask us to show you what this combination can do in reducing your "down" time for engine overhauls. Emerol Manufacturing Co., Inc., 242 W. 69th St., New York 23, N. Y.

use the **MARVEL**
INVERSE OILER WITH MARVEL MYSTERY OIL

County—	Comp.	Oil	Gas	Dry	Footage
Hockley	6	3	0	3	33,563
Howard	10	5	0	5	38,047
Irion	2	0	0	2	17,858
Lamb	3	1	0	2	18,830
Loving	4	0	0	4	16,841
Lubbock	2	0	0	2	11,619
Lynn	4	0	0	4	24,117
Martin	3	0	0	3	15,196
Menard	1	0	0	1	3,800
Midland	3	0	0	3	15,810
Mitchell	4	0	0	4	24,324
McCullough	3	0	0	3	5,871
Pecos	31	5	1	25	74,506
Reagan	8	1	0	7	37,158
Reeves	3	0	0	3	14,938
Schleicher	1	0	0	1	6,065
Sutton	1	0	0	1	5,608
Terrell	1	0	0	1	2,367
Terry	1	0	0	1	5,571
Tom Green	2	0	0	2	2,560
Upton	3	0	0	3	12,008
Val Verde	1	0	0	1	1,826
Ward	4	1	0	3	22,158
Winkler	4	2	0	2	35,790
Yoakum	8	2	0	6	43,244
Total	188	34	2	152	963,644

SOUTHEAST NEW MEXICO
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	6	0	0	6	24,584
February	6	0	0	6	25,902
March	3	0	0	3	9,585
April	6	1	1	4	26,994
May	7	0	0	7	24,235
June	5	2	0	3	24,402
July	1	0	0	1	4,765
August	5	1	2	2	19,304
September	8	1	0	7	29,118
October	4	1	0	3	16,069
November	3	1	0	2	12,947
December	13	2	0	11	46,611
Total	67	9	3	55	264,516

SOUTHEAST NEW MEXICO
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	15	9	1	5	48,472
February	36	27	0	9	103,618
March	39	30	1	8	117,546
April	17	15	1	1	49,528
May	32	23	1	8	104,115
June	24	23	0	1	67,259
July	19	19	0	0	64,000
August	15	9	0	6	64,585
September	30	27	0	3	98,016
October	32	27	0	5	106,945
November	26	21	2	3	80,544
December	33	30	0	3	112,108
Total	318	260	6	52	1,016,736

SOUTHEAST NEW MEXICO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	21	9	1	11	73,056
February	42	27	0	15	129,520
March	42	30	1	11	127,131
April	23	16	2	5	76,522
May	39	23	1	15	128,350
June	29	25	0	4	91,661
July	20	19	0	1	68,765
August	20	10	2	8	83,889
September	38	28	0	10	127,134
October	36	28	0	8	123,014
November	29	22	2	5	93,491
December	46	32	0	14	158,719
Total	385	269	9	107	1,281,252

SOUTHEASTERN NEW MEXICO
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Arrowhead	14	12	1	1	4,210
Artesia	9	7	0	2	132
Benson	4	1	0	3	150
Caprock	8	6	0	2	983
Dayton	4	4	0	0	75
Eunice, S.	2	1	1	0	92
Eunice, W.	4	3	0	1	1,574
Fenton	2	0	0	2	0
Getty	3	1	1	1	46
Grayburg-Jackson-Leonard	67	58	2	7	10,617
Hardy	2	2	0	0	96
Loco Hills	15	14	0	1	1,183
Lovington, S., (including Turner area)	14	14	0	0	5,868
Lynn	2	1	1	0	408
Maljamar	31	28	0	3	5,100
Mattix	7	6	0	1	510
Penrose	2	2	0	0	159
Red Lakes	16	12	0	4	402
Rhodes	13	13	0	0	2,867
Russell	6	4	0	2	105
San Simon	4	1	0	3	110
Shugart	4	1	0	3	25
Skelly	3	3	0	0	70
Square Lake	52	47	0	5	7,072
Tonto	3	0	0	3	0
Turkey Track	9	7	0	2	71
Vacuum	12	10	0	2	1,979
Miscellaneous	6	2	0	4	
Wildcats	67	9	3	55	2,464
Total	385	269	9	107	47,552

SOUTHEASTERN NEW MEXICO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Chaves	3	0	0	3	15,543
De Baca	4	0	0	4	11,265
Eddy	31	4	1	26	99,793
Lea	29	5	2	22	137,915
Total	67	9	3	55	264,516

NORTH AND WEST CENTRAL TEXAS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	26	3	0	23	66,879
February	21	2	0	19	55,344
March	16	2	0	14	36,215
April	42	12	0	30	126,514
May	19	4	0	15	38,023
June	31	6	0	25	92,935
July	34	9	0	25	109,293
August	43	6	0	37	154,873
September	39	6	0	33	109,595
October	42	8	0	34	147,314

Two Model ME-630 Murphy Diesels powering pump and draw works on typical drilling application

Practical Power...

For PUMP and DRAW WORKS

NO unproven frills or fads are needed for "talking points" in Murphy Diesel engines. These modern, practical Diesel power units are soundly engineered and ruggedly built for dependable service. Although compact and relatively light in weight, they perform heavy-duty work economically... they start easily, keep operating and maintenance costs low... and they do every job you want an engine to do, without flinching... in sub-station work, on mud pumps, drill rigs or other oil field power requirements. Write for bulletin.

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BUY U. S. WAR BONDS

More Power
MURPHY DIESEL
Reg. U.S. Pat. Off.
More Profit

Engines: FROM 80 to 215 HP
Generators: FROM 60 to 115 KW

"FIELD-PROVEN POWER"

Month—	Comp.	Oil	Gas	Dry	Footage
November	41	6	0	35	118,560
December	58	10	0	48	190,205
Total	412	74	0	338	1,245,750

NORTH AND WEST CENTRAL TEXAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	50	34	1	15	140,867
February	80	55	0	25	229,366
March	107	89	0	18	281,640
April	106	65	1	40	263,040
May	105	74	0	31	276,131
June	63	35	2	26	176,697
July	115	89	0	26	345,884
August	92	56	0	36	281,650
September	127	75	5	47	372,018
October	85	52	0	33	223,613
November	92	58	2	32	259,504
December	129	82	4	43	298,822
Total	1,151	764	15	372	3,149,232

NORTH AND WEST CENTRAL TEXAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	76	37	1	38	207,746
February	101	57	0	44	284,710
March	123	91	0	32	317,855
April	148	77	1	70	389,554
May	124	78	0	46	314,154
June	94	41	2	51	269,632
July	149	96	0	51	455,177
August	135	62	0	73	436,523
September	166	81	5	80	481,613
October	127	60	0	67	370,927
November	133	64	2	67	378,064
December	187	92	4	91	489,027
Total	1,563	838	15	710	4,394,982

NORTH AND WEST CENTRAL TEXAS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Archer County					
Garrett	8	4	0	4	846
Henry	10	6	0	4	167
Holliday	7	4	0	3	1,679
Luke	16	12	0	4	6,858
Ord	3	2	0	1	1,310
Vogtsberger	13	13	0	0	5,432
Misc.	121	84	0	37	3,315
Brown County					
Misc.	14	9	1	4	83
Callahan C'nty					
Scranton	2	0	1	1	0
Misc.	6	1	0	5	4
Clay County					
Joy	2	2	0	0	1,200
Ringgold	2	2	0	0	2,074
Ross-Strawn	5	4	0	1	464
Ross-Dolomite	4	3	0	1	897
Scaling	2	2	0	0	1,276
Wynn-Miss. lime	8	4	0	4	8,216
Misc.	121	69	0	52	4,798
Coleman C'nty					
Anzac Morris	2	1	0	1	33
Overall	2	2	0	0	75
Williams	15	11	0	4	4,448
Misc.	7	3	2	2	223
Comanche County					
Amity	6	6	0	0	44
Smith-Morgan	2	1	0	1	7
Misc.	1	0	0	1	0
Cooke County					
Dangle	11	9	0	2	3,723
Fleitman	10	8	0	2	218
Walnut Bend Montgomery	6	5	0	1	5,332
Walnut Bend-Winger	5	5	0	0	3,025
Woodbine	27	18	0	9	2,274
Misc.	37	22	0	15	1,044
Eastland C'nty					
Misc.	11	2	1	8	205
Fisher County					
Rotan	7	5	0	2	772
Misc.	1	1	0	0	165
Haskell County					
Strand	1	1	0	0	5
Jack County					
Ellis	14	11	0	3	3,175
Ellis-Strawn	4	3	0	1	1,338
Hoefle	5	3	0	2	1,292
McDonald-Strawn	10	9	0	1	3,638
Myers	2	0	0	2	0
Peek	5	3	0	2	1,751
Weir	6	4	0	2	552
Worsham-Steed	2	1	0	1	119
Misc.	16	8	0	8	353
Jones County					
Akard	3	3	0	0	64
Hardy	7	4	0	3	661
Noodle-Central	7	7	0	0	4,733
Noodle-South	3	2	0	1	403
Sayles	16	15	0	1	940
Stith	4	1	0	3	162
Strand	2	1	0	1	128
Wimberly	14	13	0	1	12,124
Misc.	20	13	0	7	1,002
King County					
Bateman Ranch	4	4	0	0	465
Montague C'nty					
Bowers	2	0	0	2	0
Dodson	18	13	0	5	12,930
Hildreth	70	66	0	4	58,647
Hundley	2	2	0	0	2,344
Illinois Bend	4	1	0	3	70
Mueller	3	2	0	1	1,037
Mueller-Caddo	3	2	0	1	206
Rogers & Rogers	2	2	0	0	1,369
Misc.	30	22	1	7	945
Palo Pinto County, Misc.	4	0	1	3	0
Runnels C'nty					
Beddo	2	2	0	0	376
Shackelford County					
Nail	2	0	0	2	0
Misc.	72	31	1	40	936
Stephens C'nty					
Brownville	2	2	0	0	646
Corbett	2	0	0	2	0

REPUBLIC NATIONAL BANK
OF DALLAS
DALLAS, TEXAS

CONDENSED STATEMENT OF CONDITION
AS OF DECEMBER 30, 1944

RESOURCES

Loans and Discounts		$ 83,311,031.96
Banking House		1,860,000.00
Furniture and Fixtures		260,042.63
Stock in Federal Reserve Bank		375,000.00
U. S. Government Securities		81,623,747.84
Other Bonds and Securities		1,328,944.63
Cash in Vault and with Banks		66,778,497.48
Total		$235,537,264.54

LIABILITIES

Capital	$ 6,250,000.00	
Surplus	6,250,000.00	$ 12,500,000.00
Undivided Profits		1,053,014.35
Reserve for Taxes, Etc.		848,693.07
DEPOSITS:		
Individual	$110,650,895.35	
Banks	65,842,767.28	
U. S. Government	44,641,894.49	221,135,557.12
Total		$235,537,264.54

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Field—	Comp.	Oil	Gas	Dry	Prod.
Loving	2	2	0	0	208
Misc.	32	17	1	14	5,410
Taylor County					
Reddin	1	1	0	0	31
Reddin-Frazier	1	1	0	0	117
Misc.	1	1	0	0	8
Throckmorton County					
Parrott	1	1	0	0	25
Misc.	32	16	0	16	920
Wichita County					
Airport	2	2	0	0	119
Davidson	2	1	0	1	132
K-M-A	5	3	0	2	187
K-M-A Ellenburger	9	8	0	1	4,366
West	10	10	0	0	1,799
Misc.	114	74	0	40	5,116
Wilbarger County					
Main	7	5	0	2	442
Odell	3	3	0	0	1,133
Misc.	11	7	0	4	1,491
Young County					
Allar	4	3	0	1	1,200
Burns-Ragland (Strawn)	3	2	0	1	324
Padgitt-Miss. lime	4	3	0	1	352
Sewell	7	3	2	2	2,551
Wildcats	412	74	0	338	20,318
Misc.	43	30	4	9	6,393
Total	1,563	838	15	710	224,763

NORTH & WEST CENTRAL TEXAS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Archer	88	11	0	77	183,392
Brown	3	0	0	3	2,989
Callahan	11	0	0	11	24,216
Clay	29	8	0	21	114,097
Coleman	11	2	0	9	32,060
Collin	2	0	0	2	11,968
Comanche	1	0	0	1	303
Cooke	37	8	0	29	118,981
Denton	3	0	0	3	10,122
Eastland	7	0	0	7	16,098
Fisher	2	0	0	2	11,752
Grayson	4	0	0	4	18,755
Hardeman	4	1	0	3	26,351
Haskell	4	0	0	4	16,783
Jack	10	4	0	6	58,375
Jones	43	4	0	39	119,958
King	2	0	0	2	13,476
Knox	1	0	0	1	1,806
Mills	3	0	0	3	8,767
Montague	18	6	0	12	103,029
Palo Pinto	4	0	0	4	13,768
Shackelford	12	0	0	12	25,766
Stephens	8	3	0	5	7,063
Taylor	12	3	0	9	32,915
Throckmorton	16	3	0	13	28,755
Wichita	37	7	0	30	96,759
Wilbarger	11	4	0	7	43,005
Wise	1	0	0	1	5,890
Young	28	10	0	18	98,551
Total	412	74	0	338	1,245,750

EAST TEXAS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	0	0	14	84,119
February	11	0	0	11	69,298
March	11	0	0	11	70,534
April	10	2	0	8	68,394
May	16	1	1	14	95,254
June	9	0	0	9	44,952
July	14	1	0	13	82,021
August	5	1	0	4	27,435
September	12	0	0	12	66,632
October	9	0	3	6	52,956
November	14	1	1	12	66,162
December	7	1	0	6	33,616
Total	132	7	5	120	761,373

EAST TEXAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	11	8	0	3	71,263
February	3	3	0	0	21,002
March	15	12	1	2	84,666
April	6	5	1	0	19,676
May	20	10	2	8	123,991
June	17	14	2	1	87,540
July	20	13	2	5	121,482
August	10	7	0	3	72,758
September	19	15	1	3	131,108
October	15	12	2	1	107,524
November	12	5	4	3	71,656
December	28	13	9	6	192,941
Total	176	117	24	35	1,105,607

EAST TEXAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	25	8	0	17	155,382
February	14	3	0	11	90,300
March	26	12	1	13	155,200
April	16	7	1	8	88,070
May	36	11	3	22	219,245
June	26	14	2	10	132,492
July	34	14	2	18	203,503
August	15	8	0	7	100,193
September	31	15	1	15	197,740
October	24	12	5	7	160,480
November	26	6	5	15	137,818
December	35	14	9	12	226,557
Total	308	124	29	155	1,866,980

EAST TEXAS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Calvert	2	0	0	2	0
Campbell	2	0	0	2	0
Carthage	11	0	11	0	0
Cayuga Deep	2	1	1	0	92
Chapel Hill	4	3	1	0	380
Grapeland	3	0	2	1	0
Grimes	2	0	1	1	0
Hawkins	8	8	0	0	1,599
Henderson	5	5	0	0	688
Kildare	6	3	3	0	214
Long Lake	7	6	1	0	643
Long Lake, E.	5	3	2	0	232
Manziel	26	18	1	7	5,231
New Hope	23	23	0	0	7,583

COLUMBIAN
BOLTED STEEL TANKS
Look at the Record
It is a matter of record that Columbian has for years built "TANKS FOR THE WORLD".
Today, Columbian Bolted Steel Tanks are adding to their outstanding service record on the battle fronts of the world as well as in the oil fields of the world.
For greater protection and long service depend on the record of these time-proved and war-tested tanks.
AVAILABLE TO OIL PRODUCERS.
★ The battery of Columbian tanks below are serving the Magnolia Petroleum Company in a Louisiana field.
★ Columbian COP-NIC tanks especially for sour crude will be available again as conditions permit.
COLUMBIAN STEEL TANK CO.
K.C. MO.
COP-NIC
COPPER-NICKEL ALLOY
TANKS FOR THE WORLD
ARMY E NAVY
COLUMBIAN STEEL TANK CO.
Kansas City, Mo.
TANKS For The WORLD

Field—	Comp.	Oil	Gas	Dry	Prod.
Opelika	3	0	1	2	0
Pittsburg	13	13	0	0	1,545
Powell-Edens-Kerens	7	5	0	2	19
Quitman	14	11	0	3	6,134
Sand Flat	6	4	0	2	632
Tri-Cities	2	2	0	0	223
Weiland	23	23	0	0	446
Van	4	3	0	1	68
Miscellaneous	18	6	0	12	146
Wildcats	132	7	5	120	1,362
Total	308	124	29	155	27,237

EASTERN TEXAS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Anderson	3	0	0	3	13,967
Bowie	3	0	0	3	14,416
Camp	2	0	0	2	17,052
Cass	1	0	1	0	6,731
Cherokee	4	0	0	4	22,490
Ellis	2	0	0	2	5,435
Falls	2	0	0	2	7,223
Fannin	4	0	0	4	9,038
Franklin	1	0	0	1	11,510
Freestone	2	0	0	2	8,941
Harrison	3	0	0	3	16,426
Henderson	7	0	0	7	43,202
Hopkins	6	1	0	5	39,681
Houston	4	0	0	4	19,682
Hunt	9	0	0	9	37,512
Kaufman	4	0	0	4	9,040
Lamar	2	0	0	2	6,955
Leon	2	0	0	2	5,200
Limestone	4	1	0	3	23,729
Marion	1	0	0	1	6,333
Morris	1	0	0	1	11,814
Nacogdoches	1	0	0	1	1,650
Navarro	7	0	0	7	27,112
Panola	8	3	1	4	52,502
Red River	2	0	0	2	8,311
Rains	1	0	0	1	6,200
Robertson	5	0	0	5	22,561
Rusk	6	0	0	6	35,520
Sabine	3	0	0	3	22,857
San Augustine	1	0	0	1	4,745
Shelby	1	0	0	1	6,940
Smith	8	2	0	6	62,724
Titus	3	0	0	3	19,255
Trinity	3	0	0	3	15,907
Upshur	2	0	0	2	11,887
Van Zandt	6	0	0	6	45,270
Wood	8	0	3	5	81,555
Total	132	7	5	120	761,373

SOUTH CENTRAL TEXAS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	8,084
February	3	0	0	3	6,366
March	8	0	0	8	28,864
April	0	0	0	0	0
May	5	1	0	4	20,771
June	7	0	0	7	24,806
July	4	0	0	4	15,500
August	8	0	0	8	29,940
September	6	0	0	6	18,341
October	3	0	0	3	17,660
November	8	1	0	7	27,839
December	2	0	0	2	7,925
Total	56	2	0	54	206,096

SOUTH CENTRAL TEXAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	2	0	0	11,536
February	3	1	0	2	5,867
March	2	2	0	0	2,199
April	0	0	0	0	0
May	1	0	1	0	3,630
June	7	5	1	1	17,647
July	2	2	0	0	1,426
August	8	5	0	3	20,475
September	0	0	0	0	0
October	4	3	0	1	18,341
November	2	2	0	0	6,505
December	2	2	0	0	9,558
Total	33	24	2	7	97,184

SOUTH CENTRAL TEXAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	2	0	2	19,620
February	6	1	0	5	12,233
March	10	2	0	8	31,063
April	0	0	0	0	0
May	6	1	1	4	24,401
June	14	5	1	8	42,453
July	6	2	0	4	16,926
August	16	5	0	11	50,415
September	6	0	0	6	18,341
October	7	3	0	4	36,001
November	10	3	0	7	34,344
December	4	2	0	2	17,483
Total	89	26	2	61	303,280

SOUTH CENTRAL TEXAS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Bateman (North Dale)	2	1	0	1	68
Charlotte	2	2	0	0	236
Dunlap	1	0	0	1	0
Elm Creek	3	2	0	1	10
Hilbig	1	0	0	1	0
Imogene	9	9	0	0	861
Lavernia	2	1	0	1	12
Pearsall	6	5	1	0	766
United	4	2	0	2	297
Van Cleve	1	0	1	0	0
Von Ormy	2	2	0	0	15
Wildcats	56	2	0	54	218
Total	89	26	2	61	2,483

SOUTH CENTRAL TEXAS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Atascosa	6	1	0	5	28,829
Bastrop	9	0	0	9	56,549
Bexar	4	0	0	4	4,428
Caldwell	5	0	0	5	10,260
Frio	2	0	0	2	7,823
Gonzales	6	0	0	6	28,228
Guadalupe	9	1	0	8	23,367
Kendall	1	0	0	1	2,405
Lee	4	0	0	4	16,337
Maverick	1	0	0	1	5,218
Medina	1	0	0	1	1,162
Milam	1	0	0	1	122
Val Verde	1	0	0	1	450
Williamson	1	0	0	1	1,100
Wilson	1	0	0	1	5,625
Zavala	4	0	0	4	14,193
Total	56	2	0	54	206,096

SOUTH TEXAS (LAREDO)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	11	1	0	10	47,060
February	14	0	1	13	76,273
March	15	1	0	14	58,273
April	11	0	0	11	42,067
May	20	2	0	18	82,914
June	22	1	2	19	92,546
July	10	0	1	9	44,741
August	22	1	1	20	91,599
September	9	1	0	8	28,961
October	14	1	0	13	68,601
November	13	1	1	11	54,110
December	11	0	0	11	31,410
Total	172	9	6	157	718,555

SOUTH TEXAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	18	9	2	7	69,256
February	10	8	0	2	76,970
March	24	9	3	12	140,151
April	18	12	4	2	72,039
May	34	21	1	12	139,588
June	32	20	2	10	128,054
July	19	13	1	5	87,430
August	35	18	3	14	143,244
September	25	14	5	6	89,073
October	24	11	2	11	95,914
November	35	26	2	7	144,463
December	28	14	1	13	104,290
Total	302	175	26	101	1,290,472

SOUTH TEXAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	29	10	2	17	116,316
February	24	8	1	15	153,243
March	39	10	3	26	198,424
April	29	12	4	13	114,106
May	54	23	1	30	222,502
June	54	21	4	29	220,600
July	29	13	2	14	132,171
August	57	19	4	34	234,843
September	34	15	5	14	118,034
October	38	12	2	24	164,515
November	48	27	3	18	198,573
December	39	14	1	24	135,700
Total	474	184	32	258	2,009,027

SOUTH TEXAS (Laredo)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Agua Prieta	6	2	1	3	180
Alta Mesa	2	0	0	2	0
Armstrong	20	16	2	2	2,179
Boedeker	2	0	2	0	0
Boyles	3	2	0	1	284
Cadena	9	3	1	5	225
Casa Blanca	2	2	0	0	35
Chapa	2	1	0	1	34
Charamousca	7	0	0	7	0
Charco Redondo	4	0	1	3	0
Colorado	2	1	0	1	8
Conoco-Driscoll	2	2	0	0	78
Dulup (Aviators)	15	7	0	8	378
Eagle Hill	2	2	0	0	51
East	4	1	0	3	38
Ezzell	4	1	0	3	44
Garcia	28	26	1	1	3,174
Goebel	2	1	0	1	22
Green's Branch	4	2	0	2	130
Guerra	2	2	0	0	207
Herbst	2	1	0	1	43
Jones	3	0	1	2	0
Muralla	3	0	1	2	0
Neuhaus	4	4	0	0	116
North Government Wells	3	2	0	1	160
North Rincon	23	19	1	3	2,853
Rincon	2	0	0	2	0
Rosita (Reyes)	4	3	0	1	341
Ross	26	21	1	4	2,317
San Caja	3	2	0	1	779
Scott & Hopper	3	3	0	0	452
Sejita	13	12	0	1	1,260
Seven Sisters	3	1	2	0	20
South Bruni	4	2	1	1	57
South Calliham	2	0	0	2	0
Southland-Longhorn	7	5	1	1	372
Sun, North	10	5	0	5	535
Thomas-Lockhart	9	3	2	4	300
Washburn	5	1	1	3	375
Weil	8	6	0	2	735
Yaeger	3	2	0	1	67
Yturria	8	5	0	3	434
Miscellaneous	32	7	7	18	1,184
Wildcats	172	9	6	157	914
Total	474	184	32	258	20,429

SOUTH TEXAS (Laredo)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Brooks	9	2	1	6	66,247
Duval	56	4	0	52	234,539
Jim Hogg	20	1	0	19	83,062
LaSalle	3	0	0	3	17,637
Live Oak	17	1	0	16	94,324
McMullen	6	1	0	5	27,376
Starr	23	0	3	20	63,839
Webb	23	0	2	21	76,282
Zapata	15	0	0	15	35,257
Total	172	9	6	157	718,555

LOWER GULF COAST
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	8	3	0	5	59,311
February	11	2	0	9	69,851
March	12	3	2	7	74,385
April	8	2	1	5	48,942
May	16	3	0	13	109,132
June	16	3	2	11	111,946
July	13	3	3	7	89,919
August	17	0	3	14	113,611
September	15	2	0	13	105,313
October	7	1	1	5	42,010
November	12	2	1	9	85,468
December	9	0	0	9	56,990
Total	144	24	13	107	966,878

County—	Comp.	Oil	Gas	Dry	Footage
Jefferson	14	2	0	12	130,936
Lavaca	4	2	0	2	31,625
Liberty	3	0	0	3	24,591
Matagorda	12	1	0	11	104,985
Montgomery	1	0	0	1	8,258
Newton	3	0	0	3	28,522
Polk	2	0	0	2	12,805
San Jacinto	5	0	0	5	44,007
Trinity	4	0	0	4	21,664
Tyler	4	0	0	4	23,398
Walker	1	0	0	1	7,042
Waller	1	0	0	1	3,347
Wharton	18	3	1	14	118,455
Total	161	20	4	137	1,214,286

SOUTH LOUISIANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	0	0	7	75,765
February	7	1	0	6	74,899
March	3	2	0	1	31,332
April	7	1	0	6	78,482
May	6	2	0	4	68,219
June	5	1	0	4	56,669
July	4	2	0	2	39,194
August	3	0	0	3	31,511
September	3	1	0	2	31,403
October	5	2	0	3	47,328
November	5	2	0	3	53,005
December	2	0	0	2	24,366
Total	57	14	0	43	612,173

SOUTH LOUISIANA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	18	14	1	3	172,788
February	25	19	1	5	128,605
March	38	28	1	9	337,569
April	31	18	1	12	288,609
May	39	31	0	8	356,882
June	40	29	1	10	361,381
July	35	26	0	9	302,281
August	48	37	1	10	431,610
September	32	19	2	11	303,122
October	27	19	1	7	231,617
November	51	33	5	13	488,750
December	33	23	1	9	300,051
Total	417	296	15	106	3,703,265

SOUTH LOUISIANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	25	14	1	10	248,553
February	32	20	1	11	203,504
March	41	30	1	10	368,901
April	38	19	1	18	367,091
May	45	33	0	12	425,101
June	45	30	1	14	418,050
July	39	28	0	11	341,475
August	51	37	1	13	463,121
September	35	20	2	13	334,525
October	32	21	1	10	278,945
November	56	35	5	16	541,755
December	35	23	1	11	324,417
Total	474	310	15	149	4,315,438

SOUTH LOUISIANA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Arnaudville	2	1	0	1	53
Avery Island	3	2	0	1	661
Bastian Bay	4	2	0	2	397
Bayou Couba	2	1	0	1	72
Bayou Des Allemands	2	2	0	0	202
Bayou Sale	14	10	0	4	2,951
Bayou Serpent	2	2	0	0	414
Bay St. Elaine	3	3	0	0	639
Bear	3	1	0	2	97
Belle Isle	4	1	0	3	146
Black Bayou	3	1	0	2	45
Bully Camp	7	4	1	2	1,057
Caillou Island	6	5	0	1	1,283
Chacahoula Lake	7	4	1	2	482
Charenton	2	2	0	0	429
Delta Duck Club	5	4	0	1	1,033
Delta Farms	15	15	0	0	3,661
Dog Lake	2	2	0	0	547
East Gibson	2	0	2	0	0
East Hackberry	6	2	0	4	540
East White Lake	7	7	0	0	1,498
Egan	2	2	0	0	590
Erath	18	16	0	2	2,757
Fresh Water Bayou	2	0	1	1	0
Garden Island Bay	4	3	0	1	228
Gibson	4	3	0	1	841
Good Hope	2	2	0	0	448
Gordon	4	2	0	2	138
Grand Bay	5	5	0	0	1,550
Gueydon	7	4	1	2	950
Gum Cove	2	2	0	0	242
Hester (Convent)	4	2	0	2	317
Hope Villa	2	0	0	2	0
Jefferson Island	2	0	0	2	0
Krotz Springs	3	3	0	0	234
Lake Chicot	5	4	0	1	904
Lake Fausse Point	2	2	0	0	465
Lake Pelto	4	2	1	1	431
Lake Salvador	6	6	0	0	1,324
La Pice	7	6	0	1	1,588
Laurel Ridge	2	2	0	0	145
Leeville	4	4	0	0	841
Lockport	2	2	0	0	237
Neale	17	15	0	2	8,092
North Cankton	5	4	1	0	1,418
North Crowley	2	1	0	1	152
N. E. Gibson	3	2	1	0	607
North Richie	5	4	0	1	464
Paradis	8	8	0	0	1,510
Perkins	3	0	3	0	0
Pine Prairie	16	14	0	2	4,380
Porte Barre	6	3	0	3	668
Potash	3	2	0	1	368
Quarantine Bay	3	3	0	0	721
Raceland	3	1	0	2	195
Reddell	4	3	0	1	592
Roanoke	7	7	0	0	1,572
Rosedale	7	4	0	3	678
St. Gabriel	3	1	0	2	235
St. James	2	1	0	1	163
Sorrento	2	0	0	2	0
South Houma	2	0	0	2	0
So. Roanoke (Lake Arthur)	3	3	0	0	644
Starks	9	3	1	5	267
University	5	4	0	1	692
Vacherie (Hester)	4	3	0	1	288
Venice	5	5	0	0	1,148
Ville Platte	2	2	0	0	298
Vinton	35	29	0	6	4,269
West Bay	6	6	0	0	2,031
West Cote Blanche Bay	3	1	0	2	235
West Gueydon	4	3	0	1	659
West Hackberry	2	2	0	0	1,142
West Lake Verret	4	3	0	1	763
W. Tepetate (Panchoville)	2	2	0	0	1,410
White Castle	5	3	0	2	805
Miscellaneous	33	11	2	20	1,302
Wildcats	57	14	0	43	3,271
Total	474	310	15	149	71,476

SOUTH LOUISIANA
Wildcat Completions by Parishes

Parish—	Comp.	Oil	Gas	Dry	Footage
Acadia	4	1	0	3	42,419
Ascension	1	0	0	1	11,227
Assumption	3	0	0	3	36,324
Beauregard	3	1	0	2	39,325
Calcasieu	3	2	0	1	31,444
Cameron	8	1	0	7	80,640
E. Baton Rouge	1	0	0	1	10,012
Evangeline	1	0	0	1	9,764
Iberia	5	0	0	5	60,579
Iberville	4	3	0	1	33,688
Jefferson	1	0	0	1	10,985
Jefferson Davis	2	2	0	0	19,334
Lafourche	1	0	0	1	11,284
Plaquemines	1	0	0	1	11,083
Rapides	1	0	0	1	7,001
St. Charles	1	1	0	0	10,171
St. James	1	1	0	0	10,893
St. Landry	2	1	0	1	21,386
St. Martin	1	0	0	1	9,766
St. Mary	2	0	0	2	23,557
Tangipahoa	2	0	0	2	18,543
Terrebonne	6	1	0	5	68,074
Vermilion	3	0	0	3	34,674
Total	57	14	0	43	612,173

NORTH LOUISIANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	11,464
February	5	1	0	4	25,024
March	9	1	0	8	58,290
April	4	0	0	4	19,200
May	2	0	0	2	1,480
June	7	1	0	6	37,184
July	7	0	0	7	45,557
August	5	0	1	4	19,387
September	6	1	0	5	37,073
October	10	3	0	7	52,891
November	7	1	0	6	38,972
December	10	2	0	8	56,028
Total	74	10	1	63	402,550

NORTH LOUISIANA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	13	4	5	4	55,587
February	12	5	0	7	38,619
March	15	7	1	7	80,181
April	24	14	3	7	94,471
May	18	11	1	6	50,429
June	27	14	3	10	121,895
July	19	7	7	5	69,994
August	28	10	9	9	82,870
September	31	12	13	6	137,131
October	22	9	9	4	82,988
November	20	7	7	6	84,481
December	26	9	8	9	107,126
Total	225	109	66	80	1,005,772

NORTH LOUISIANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	15	4	5	6	67,051
February	17	6	0	11	63,643
March	24	8	1	15	138,471
April	28	14	3	11	113,671
May	20	11	1	8	51,909
June	34	15	3	16	159,079
July	26	7	7	12	115,551
August	33	10	10	13	102,257
September	37	13	13	11	174,204
October	32	12	9	11	135,879
November	27	8	7	12	123,453
December	36	11	8	17	163,154
Total	329	119	67	143	1,408,322

NORTH LOUISIANA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Bear Creek	2	0	1	1	0
Bellevue	19	14	0	5	125
Bull Bayou	2	0	0	2	0
Caddo	26	17	1	8	1,257
Catahoula Lake	3	1	0	2	192
Converse	2	1	0	1	20
Elm Grove	2	2	0	0	45
Haynesville Ext.	5	2	0	3	254
Holly	41	20	1	20	1,694
Holly Ridge	26	16	4	6	9,226
Lake St. John	20	16	2	2	4,589
Lisbon	9	3	6	0	424
Little Creek	2	1	0	1	28
Logansport	2	0	2	0	0
Monroe Gas	40	0	40	0	0
Nebo	7	5	0	2	640
Ruston Gas	5	0	2	3	0
Shongaloo	3	1	0	2	85
Sugar Creek	2	0	1	1	0
Vivian	6	1	0	5	100
Miscellaneous	31	9	6	16	314
Wildcats	74	10	1	63	1,494
Total	329	118	67	143	20,487

NORTH LOUISIANA
Wildcat Completions by Counties

Parish—	Comp.	Oil	Gas	Dry	Footage
Bienville	2	1	0	1	11,143
Bossier	5	1	0	4	19,377
Caddo	6	0	0	6	18,109
Caldwell	3	0	0	3	21,065

What to do about Rust?

MAKE THIS TEST

Immerse any rusty nail in a small quantity of Cities Service Rust Remover. If badly rusted, allow to remain for several minutes. You can actually see the rust dissolve.

SEE THE RESULTS

Remove nail and wipe dry with cloth or tissue. Note the complete absence of rust and the way the original surface reappears.

CITIES SERVICE RUST REMOVER has been tested for four years throughout a small, highly industrialized area in the East, where it has earned a unique reputation for performance. RUST REMOVER is a clean, clear liquid, practically odorless, non-inflammable, easily applied, and harmless to handle by those not allergic to specific chemicals. It is fast-acting, and, although heating somewhat accelerates results, general application is recommended at normal temperature (60°-90° F.). RUST REMOVER is effective on chromium, copper, aluminum, steel and iron.

5 Big Advantages
1. Non-Inflammable
2. Harmless to Normal Skin
3. Makes Metals Chemically Clean
4. Removes Rust by Chemical Action
5. Free from Muriatic, Sulphuric, Nitric and Oxalic Acids or Cyanide.
CITIES SERVICE
RUST REMOVER

See a Free Demonstration of Rust Remover on Your Own Equipment.

Available only in Cities Service marketing territory EAST of the Rockies.)

MAIL THIS COUPON TODAY!

Cities Service Oil Company
Room 180
Sixty Wall Tower, New York 5, N.Y.

Gentlemen: I'd like to test RUST REMOVER on my own equipment, free of charge. Send me details.

Name.....
Company.....
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CITIES SERVICE OIL COMPANY
NEW YORK · CHICAGO

ARKANSAS FUEL OIL COMPANY
SHREVEPORT, LA.

The Constant Level Oil Control Valve

Insures the Success of the Modern Vaporizing Type Gravity Oil Burner

SPACE HEATERS and other appliances equipped with the Gravity-flow Vaporizing type of Oil Burner consume millions of gallons of fuel oil in the course of a year.

MILLIONS MORE gallons will be required for the additional oil-heating units scheduled for post-war production.

The original and continued success of the popular Gravity-flow Vaporizing type of Oil Burner is directly due to the development of the Constant Level Oil Control Valve. In this field, "A-P" has achieved widespread recognition for the design and building of the most accurate and dependable of controls.

There are interesting market facts available on the number of Vaporizing Type Gravity Oil Burning Space Heaters in use today, and the production plans for post-war. Let us give you this story.

AUTOMATIC PRODUCTS COMPANY
2438 NORTH THIRTY — SECOND STREET
MILWAUKEE 10 WISCONSIN

"A-P" Model 240-U Constant Level Oil Control

ap DEPENDABLE Oil Control Valves

Parish—	Comp.	Oil	Gas	Dry	Footage
Catahoula	4	1	0	3	20,382
Claiborne	2	1	0	1	18,158
DeSoto	9	1	1	7	33,890
East Carroll	1	0	0	1	5,191
Franklin	3	0	0	3	21,396
Grant	3	0	0	3	13,731
LaSalle	4	0	0	4	32,353
Lincoln	1	1	0	0	9,768
Madison	1	0	0	1	4,470
Morehouse	5	0	0	5	28,463
Natchitoches	2	0	0	2	7,675
Ouachita	1	0	0	1	6,363
Red River	1	0	0	1	3,994
Richland	2	1	0	1	7,846
Sabine	4	0	0	4	11,402
Tensas	5	2	0	3	45,524
Union	3	0	0	3	16,613
Webster	4	1	0	3	30,665
West Carroll	2	0	0	2	8,858
Winn	1	0	0	1	6,114
Total	74	10	1	63	402,550

ARKANSAS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	6	0	0	6	25,825
February	6	1	0	5	23,583
March	5	1	0	4	32,182
April	7	0	0	7	25,814
May	3	0	0	3	10,896
June	5	1	0	4	28,752
July	4	0	0	4	17,500
August	9	0	0	9	40,520
September	4	0	0	4	17,108
October	5	0	0	5	29,378
November	2	0	0	2	17,771
December	6	0	0	6	35,010
Total	62	3	0	59	304,339

ARKANSAS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	3	0	1	21,971
February	15	12	0	3	96,643
March	15	12	1	2	84,102
April	8	7	0	1	51,721
May	11	8	0	3	57,804
June	19	15	0	4	128,202
July	17	12	1	4	91,030
August	9	8	0	1	42,945
September	14	13	0	1	77,200
October	11	10	0	1	59,761
November	9	9	0	0	51,623
December	21	16	0	5	122,233
Total	153	125	2	26	885,235

ARKANSAS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	10	3	0	7	47,796
February	21	13	0	8	120,226
March	20	13	1	6	116,284
April	15	7	0	8	77,535
May	14	8	0	6	68,700
June	24	16	0	8	156,954
July	21	12	1	8	108,530
August	18	8	0	10	83,465
September	18	13	0	5	94,308
October	16	10	0	6	89,139
November	11	9	0	2	69,394
December	27	16	0	11	157,243
Total	215	128	2	85	1,189,574

ARKANSAS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Atlanta	4	4	0	0	749
Atlanta, West	7	7	0	0	943
Dorcheat-Macedonia	31	28	0	3	6,458
Fouke	13	11	0	2	1,473
Haynesville Ext.	18	17	0	1	11,802
Irma-Troy	7	5	0	2	140
Mount Holly	4	4	0	0	501
Rainbow City	7	4	1	2	260
Smackover	4	0	0	4	0
Stephens	27	23	0	4	2,472
Village	7	6	0	1	1,052
Miscellaneous	24	16	1	7	1,463
Wildcats	62	3	0	59	230
Total	215	128	2	85	27,543

ARKANSAS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Ashley	5	0	0	5	28,126
Calhoun	3	0	0	3	10,776
Chicot	3	0	0	3	13,949
Clay	2	0	0	2	1,040
Cleveland	1	0	0	1	4,206
Columbia	6	1	0	5	48,519
Hempstead	4	0	0	4	20,989
Lafayette	2	0	0	2	13,238
Little River	2	0	0	2	1,476
Logan	1	0	0	1	4,747
Miller	1	0	0	1	6,465
Nevada	6	0	0	6	27,150
Ouchita	7	0	0	7	21,034
Prairie	1	0	0	1	3,202
Union	17	2	0	15	94,717
Yell	1	0	0	1	4,705
Total	62	3	0	59	304,339

MISSISSIPPI
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	5	0	0	5	35,607
February	2	1	0	1	16,573
March	6	1	0	5	23,930
April	5	1	0	4	26,016
May	5	0	0	5	21,760
June	7	0	0	7	43,087
July	10	0	0	10	65,693
August	6	1	0	5	46,378
September	5	0	1	4	24,496
October	5	0	0	5	28,469
November	8	1	0	7	56,521
December	8	1	0	7	39,651
Total	72	6	1	65	428,181

MISSISSIPPI
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	5	4	0	1	28,967
February	3	0	0	3	18,203
March	2	2	0	0	12,088
April	3	1	0	2	12,916
May	1	1	0	0	5,040
June	10	10	0	0	55,836
July	7	7	0	0	35,004
August	10	7	0	3	52,022
September	9	8	1	0	45,183
October	8	7	0	1	39,403
November	19	17	0	2	108,298
December	7	7	0	0	34,617
Total	84	71	1	12	447,577

MISSISSIPPI
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	10	4	0	6	64,574
February	5	1	0	4	34,776
March	8	3	0	5	36,018
April	8	2	0	6	38,932
May	6	1	0	5	26,800
June	17	10	0	7	96,923
July	17	7	0	10	100,697
August	16	8	0	8	98,400
September	14	8	1	5	69,679
October	13	7	0	6	67,872
November	27	18	0	9	164,819
December	15	8	0	7	74,268
Total	156	77	1	78	875,758

MISSISSIPPI
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Brookhaven	1	0	0	1	0
Cransfield	4	2	0	2	717
Eucutta	10	8	0	2	1,185
Flora	1	1	0	0	75
Heidelberg	55	53	0	2	17,945
Pickens	12	7	0	5	1,205
Tinsley	1	1	0	0	187
Wildcats	72	6	1	65	3,025
Total	156	77	1	78	24,339

MISSISSIPPI
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Adams	2	1	0	1	19,112
Attala	2	0	0	2	9,872
Claiborne	7	0	1	6	22,800
Clark	1	0	0	1	5,626
Copiah	4	0	0	4	29,249
Covington	2	0	0	2	3,548
Franklin	1	0	0	1	10,700
Greene	1	0	0	1	12,328
Hinds	2	0	0	2	11,163
Holmes	1	0	0	1	6,320
Humphreys	1	0	0	1	5,500
Issaquena	2	0	0	2	10,641
Jasper	9	1	0	8	54,515
Jeff Davis	4	1	0	3	12,896
Jones	3	0	0	3	23,311
Kemper	1	0	0	1	3,008
Lamar	2	1	0	1	18,645
Lauderdale	2	0	0	2	6,289
Leake	1	0	0	1	4,120
Lincoln	2	1	0	1	14,654
Madison	5	0	0	5	28,887
Rankin	2	0	0	2	18,137
Scott	1	0	0	1	7,510
Simpson	1	0	0	1	8,908
Smith	4	0	0	4	21,436
Tate	1	0	0	1	3,018
Union	1	0	0	1	1,617
Washington	1	0	0	1	6,677
Wayne	2	1	0	1	18,113
Wilkinson	1	0	0	1	9,995
Yazoo	3	0	0	3	19,586
Total	72	6	1	65	428,181

ALABAMA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	7,860
February	1	1	0	0	5,380
March	1	0	0	1	6,168
April	4	0	0	4	20,325
May	1	0	0	1	4,523
June	0	0	0	0	0
July	0	0	0	0	0
August	2	0	0	2	7,914
September	5	0	0	5	28,670
October	2	0	0	2	13,997
November	2	0	0	2	12,110
December	0	0	0	0	0
Total	19	1	0	18	106,947

ALABAMA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	0	0	0	0	0
February	0	0	0	0	0
March	1	1	0	0	3,755
April	2	1	0	1	7,608
May	2	1	0	1	7,554
June	1	0	0	1	5,330
July	1	1	0	0	5,317
August	2	2	0	0	9,550
September	4	2	0	2	12,730
October	0	0	0	0	0
November	2	1	0	1	8,778
December	0	0	0	0	0
Total	15	9	0	6	60,622

ALABAMA
Total Completions by Months

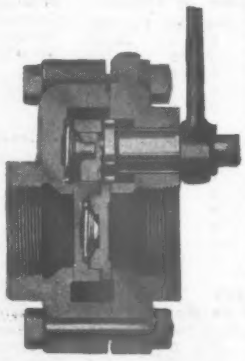
Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	7,860
February	1	1	0	0	5,380
March	2	1	0	1	9,923
April	6	1	0	5	27,933
May	3	1	0	2	12,077
June	1	0	0	1	5,330
July	1	1	0	0	5,317
August	4	2	0	2	17,464
September	9	2	0	7	41,400
October	2	0	0	2	13,997
November	4	1	0	3	20,888
December	0	0	0	0	0
Total	34	10	0	24	167,569

ALABAMA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Choctaw	5	1	0	4	26,661
Escambia	4	0	0	4	33,015
Lamar	1	0	0	1	3,170
Lauderdale	1	0	0	1	500
Marengo	1	0	0	1	4,523
Mobile	1	0	0	1	4,744
Walker	1	0	0	1	1,719
Washington	5	0	0	5	32,615
Total	19	1	0	18	106,947

WIDE OPEN—OR TIGHT SHUT—with less than a quarter turn

IN oil fields and refineries there are innumerable spots where valves must be depended upon for quick action. That is why so many Everlasting Valves are chosen for emergency throttle service on drilling engines; for gasoline and oil loading racks; air lines for air lift pumping; fire protection lines; meter testing; spray lines; tank outlets; process lines; etc.



Everlasting Valves open quickly to full pipe-line straight-through flow—or close to a drop-tight seal. They stay tight, too, for they are self-grinding. Do not stick, bind or clog. And because stoutly constructed of best selected metals, they have astonishingly long service life.

Made in straight lever and rack-and-pinion types. In cast iron, bronze, cast steel, ¼" to 6" sizes. For pressures up to 600 lbs. Fully guaranteed.

For full information, write for free Bulletin.

EVERLASTING VALVE COMPANY
49 Fisk St., Jersey City 5, N. J.

Everlasting Valves
for everlasting protection

BEFORE YOU BUY

. . . it will pay you to investigate the results obtained by the use of Honan-Crane Oil Purification Equipment.

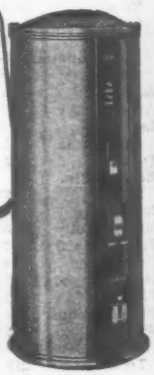
★ There are too many operators who are sour on Oil Purification . . . completely disappointed with the results they are getting with cheap and inadequate oil filters and strainers.

Honan-Crane "Continuous" Oil Purifiers are constantly replacing this inefficient equipment, but such costly experimentation is the long, hard way to get good results.

We believe that if any operator or prospective purchaser will first expose himself to the value of Honan-Crane Equipment in the terms of *results attained*, he will *buy* Honan-Crane and get the kind of Oil Purification every operator wants . . . THE CONTINUOUS REMOVAL OF ALL ABRASIVES, ACIDS, SLUDGES and DANGEROUS CONTAMINATION AS FAST AS IT IS LIBERATED BY THE OPERATING EQUIPMENT.

The cost of such effective purification is very small in relation to the savings accomplished in reduced wear and lowered maintenance costs.

Write for engineering bulletins and complete information on the purification of any kind of oil.



HONAN-CRANE CORPORATION
Subsidiary of Houdaille-Hershey Corp.
206 Wabash Avenue Lebanon, Indiana

GEORGIA-FLORIDA

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	1	0	1	15,740
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	1	0	0	1	5,400
July	1	0	0	1	3,460
August	2	0	0	2	13,687
September	3	0	0	3	17,853
October	0	0	0	0	0
November	2	0	0	2	10,185
December	2	0	0	2	13,334
Total	13	1	0	12	79,659

GEORGIA

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Clinch	2	0	0	2	7,570
Decatur	1	0	0	1	6,200
Echols	1	0	0	1	3,850
Mitchell	1	0	0	1	7,487
Wayne	1	0	0	1	4,626
Total	6	0	0	6	29,733

FLORIDA

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Collier	2	1	0	1	25,144
Gulf	1	0	0	1	8,708
Leon	2	0	0	2	7,009
Madison	2	0	0	2	9,065
Total	7	1	0	6	49,926

OKLAHOMA

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	13	3	0	10	67,717
February	29	5	4	20	128,308
March	28	5	3	20	129,732
April	25	3	2	20	111,232
May	31	4	2	25	135,759
June	40	4	6	30	183,870
July	33	12	2	19	146,006
August	31	5	1	25	135,444
September	48	14	1	33	181,123
October	34	10	0	24	149,155
November	34	6	0	28	139,361
December	27	5	2	20	102,693
Total	373	76	23	274	1,610,400

OKLAHOMA

Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	71	38	10	23	233,986
February	100	58	13	29	330,510
March	115	67	14	34	369,782
April	113	76	9	28	410,105
May	115	67	18	30	319,469
June	150	97	20	33	543,715
July	131	69	19	43	407,936
August	128	79	18	31	455,572
September	204	127	32	45	827,999
October	139	99	15	25	579,790
November	151	97	17	37	626,866
December	100	81	4	15	455,547
Total	1,517	955	189	373	5,561,277

OKLAHOMA

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	84	41	10	33	301,703
February	129	63	17	49	458,818
March	143	72	17	54	499,514
April	138	79	11	48	521,337
May	146	71	20	55	455,228
June	190	101	26	63	727,585
July	164	81	21	62	553,942
August	159	84	19	56	491,016
September	252	141	33	78	1,009,122
October	173	109	15	49	728,945
November	185	103	17	65	766,227
December	127	86	6	35	558,240
Total	1,890	1,031	212	647	7,171,677

OKLAHOMA

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Allen	8	3	0	5	923
Cement	34	24	5	5	10,698
Cheyarha	13	10	2	1	1,156
Comanche	11	3	1	7	87
Crescent District	35	28	0	7	6,228
Cromwell & East	13	10	0	3	893
Cumberland	29	27	0	2	33,285
Cushing	17	10	2	5	234
Deep Fork	7	5	0	2	157
Doyle	8	6	0	2	810
Duncan, West	25	10	3	12	3,137
Ed Cox	10	9	0	1	369
Edmond, West	268	256	0	10	236,444
Fort Sill Reservation	12	5	3	4	199
Garber	11	11	0	0	385
Glenn	29	26	2	1	191
Healdton	11	6	0	5	68
Hoover, NW	17	9	2	6	1,058
Horns Corner & North	14	7	0	7	1,776
Hugoton	82	0	82	0	0
Loco	43	32	1	10	689
Loco, West	35	23	0	12	680
Lone Grove	14	12	0	2	4,864
Lovell & South	9	4	1	4	941
Lucien & North	7	3	0	4	106
Mehan & NE	18	13	0	5	2,181
Moore, South	2	1	0	1	590
Moore, West	11	7	0	4	2,832
Okla. City	5	3	0	2	406
Otoe City & East	14	11	0	3	854
Paul's Valley	38	29	2	7	10,855
Paul's Valley, East	23	21	0	2	4,357
Scholem-Alechem	9	8	0	1	809
Seay	5	2	0	3	10
Stroud	26	21	3	2	2,981
Stroud, SE	16	14	1	1	806

GATKE Brake Blocks *Pay Double* NOW!

The *Extra Performance Qualities* of GATKE Brake Blocks *are life savers* in these days of critical man power and material shortage.

The *great holding power* with *smooth, non-grabbing action* at all depths gets the job done *quicker* with reduced strain on men and equipment.

Long wear life with reduced flange wear facilitates *continuous* operation and *avoids maintenance.*

Avoid substitutes. Your Rig Manufacturers have GATKE Brake Lining that's engineered for the job.

GATKE Brake Blocks are made in many types to meet all service requirements of Oil Field Equipment.

Their Extra Performance Qualities result from nearly 30 years specialized development to meet changing requirements of Oil Field Service.

When your rig is GATKE-equipped, you have the best.

GATKE CORPORATION

228 N. LaSalle St. Chicago 1, Ill.

Field–	Comp.	Oil	Gas	Dry	Prod.
Tussey	8	6	0	8	869
Velma & North	68	51	4	13	1,922
Wewoka Dist.	27	19	1	7	2,072
Carter County Misc.	15	7	1	7	784
Creek County Misc.	64	37	11	16	1,401
Hughes County Misc.	32	12	7	13	966
Kay County Misc.	13	4	1	8	202
Lincoln County Misc.	20	9	2	9	391
Okfuskee County Misc.	44	15	10	19	1,082
Okmulgee County Misc.	38	14	11	13	168
Osage County Misc.	66	40	5	21	1,786
Payne	24	11	2	11	1,990
Pontotoc County Misc.	11	5	1	5	240
Pottawatomie County Misc.	21	9	1	11	899
Stephens County Misc.	13	5	0	8	68
Tulsa County Misc.	20	4	4	12	67
Miscellaneous	106	38	18	50	23,877
Wildcats	373	76	23	274	28,956
Total	1,890	1,031	212	647	399,799

OKLAHOMA

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Atoka	3	0	0	3	13,702
Beckham	1	0	0	1	2,291
Bryan	2	0	0	2	6,178
Caddo	2	0	0	2	19,456
Canadian	5	2	0	3	35,911
Carter	19	6	0	11	95,396
Choctaw	1	0	0	1	2,308
Cimarron	1	0	0	1	7,024
Cleveland	11	5	0	6	74,543
Coal	3	0	1	2	19,609
Comanche	3	0	0	3	11,747
Cotton	4	0	1	3	10,173
Creek	17	6	0	11	58,526
Ellis	1	0	0	1	9,305
Garfield	6	0	0	6	26,867
Garvin	35	12	3	22	129,374
Grady	5	0	0	5	28,536
Grant	3	0	0	3	16,538
Greer	4	0	0	4	2,436
Hughes	27	5	1	21	105,445
Jackson	2	0	0	2	5,230
Jefferson	9	0	0	9	19,608
Kay	10	0	1	9	39,323
Kiowa	3	0	0	3	9,201
Le Flore	1	0	1	0	4,800
Lincoln	22	1	2	19	99,387
Logan	13	5	0	8	75,807
Love	3	0	1	2	15,682
Marshall	3	0	0	3	14,481
McClain	3	2	0	1	39,964
McCurtain	2	0	0	2	1,960
Murray	1	0	0	1	6,313
Muskogee	1	0	0	1	998
Noble	10	0	0	10	45,182
Okfuskee	18	5	3	10	65,877
Oklahoma	16	11	0	5	106,194
Okmulgee	4	0	1	3	10,208
Osage	11	2	1	8	33,181
Pawnee	14	1	1	12	51,174
Payne	13	3	0	10	58,321
Pittsburgh	2	0	1	1	6,133
Pontotoc	6	1	1	4	16,485
Pottawatomie	9	2	0	7	46,002
Seminole	15	2	1	12	56,857
Stephens	22	2	3	17	80,966
Texas	1	0	0	1	5,888
Tillman	2	0	0	2	7,196
Tulsa	1	1	0	0	1,520
Washita	3	2	0	1	21,097
Total	373	76	23	274	1,610,400

KANSAS

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	27	2	0	25	92,849
February	49	9	0	40	173,837
March	35	3	2	30	136,302
April	45	5	1	39	161,987
May	35	5	1	29	127,306
June	53	5	1	47	195,818
July	34	3	0	31	124,818
August	45	3	1	41	174,130
September	58	7	3	48	210,990
October	35	2	0	33	127,095
November	47	3	1	43	176,526
December	28	2	0	26	102,967
Total	491	49	10	432	1,804,525

KANSAS

Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	121	68	5	48	353,265
February	108	61	2	45	359,897
March	96	59	4	35	329,208
April	101	63	4	34	337,662
May	76	50	3	23	246,659
June	149	93	5	51	491,612
July	107	68	3	36	359,515
August	127	84	1	42	420,375
September	133	79	9	45	438,459
October	116	58	9	49	388,081
November	105	53	12	40	331,103
December	105	39	26	40	334,072
Total	1,346	775	83	488	4,389,908

KANSAS

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	148	70	5	73	446,114
February	156	70	2	84	533,734
March	134	62	6	66	465,510
April	146	68	5	73	499,649
May	111	55	4	52	373,865
June	202	98	6	98	687,430
July	141	71	3	67	484,333
August	172	87	2	83	594,505
September	191	86	12	93	649,449
October	151	60	9	82	515,176
November	152	56	13	83	507,629
December	133	41	26	66	437,039
Total	1,937	824	93	920	6,194,433

KANSAS

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Adell	5	5	0	0	3,825
Ames	8	6	0	2	2,224
Atherton	15	7	0	8	2,330
Barrett	6	4	0	2	883
Barry	13	9	0	4	17,513
Beeching	5	3	0	2	1,337
Bemis-Shutts	10	6	0	4	727
Big Creek	23	18	0	5	9,418
Bornholdt	6	4	0	2	988
Boyd	20	18	0	2	13,531
Brandt-Sensenbaugh	11	5	0	6	455
Carmi	24	21	0	3	23,724
Chase	28	23	0	5	4,688
Chitwood	28	25	0	3	40,553
Coats	7	2	0	5	458
Cunningham	13	11	0	2	2,982
Davidson	9	4	0	5	575
Doran & West	5	3	0	2	405
Drach	10	6	0	4	7,488
El Dorado	24	16	0	8	1,384
Ellis	7	4	0	3	725
Eveleigh	7	4	0	3	948
Farmington	11	8	1	2	9,073
Ferrell	6	3	0	3	95
Forest Hill	8	3	0	5	2,594
Gorham	7	3	0	4	322
Hall-Gurney	35	24	0	11	11,737
Heyen	5	2	0	3	2,168
Hilger	10	7	0	3	5,510
Hugoton	55	0	55	0	0
Hunter	6	4	0	2	612
Janne	10	5	0	5	529
Kraft-Prusa	61	43	1	17	48,356
Lindsborg	23	19	0	4	3,618
Lost Springs & North	29	22	0	7	1,701
McCandless	5	3	0	2	2,960
McLouth	11	2	0	9	80
Marcotte	7	6	0	1	9,583
Merten	5	3	0	2	556
Morel	35	24	0	11	47,825
Mueller	6	6	0	0	8,225
Paden	16	12	0	4	3,918
Pawnee Rock	6	4	0	2	768
Pleasant	2	2	0	0	543
Pritchard	9	5	0	4	4,848
Rahn	11	7	0	4	1,758
Ritz-Canton	6	1	0	5	20
Riverview	11	9	0	2	16,182
St. John's Townsite	8	6	0	2	10,196
Silica	26	12	0	14	4,056
Stark & North	6	5	0	1	927
Stoltenburg	28	22	0	6	4,812
Studley	5	2	0	3	8
Trapp	47	31	0	16	13,847
Vaughn	6	5	0	1	1,434
Virgil	11	7	0	4	138
Virgil, North	10	7	0	3	161
Wilkins & S.E.	7	5	0	2	356
Zenith Peace Creek	40	33	4	3	49,199
Zenith, West	9	7	0	2	6,769
Miscellaneous	463	202	22	239	28,811
Wildcats	491	49	10	432	23,156
Total	1,837	824	93	920	467,611

KANSAS

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Barber	19	1	5	13	92,668
Barton	35	7	0	28	127,689
Brown	1	0	0	1	2,886
Butler	19	1	0	18	56,497
Comanche	1	0	0	1	5,604
Cowley	25	1	0	24	81,947
Decatur	2	0	0	2	8,800
Dickinson	12	0	0	12	34,651
Doniphan	1	0	0	1	2,090
Douglas	2	0	0	2	3,126
Edwards	3	0	0	3	14,431
Ellis	26	3	0	23	96,475
Ellsworth	18	2	0	16	60,027
Finney	2	0	1	1	7,583
Ford	2	0	0	2	12,978
Geary	1	0	0	1	2,830
Gove	4	0	0	4	19,611
Graham	11	1	0	10	43,668
Greenwood	8	1	0	7	19,331
Harper	1	0	0	1	4,910
Harvey	4	1	1	2	14,367
Hodgeman	3	0	0	3	15,210
Jackson	1	0	0	1	2,538
Jefferson	2	0	0	2	3,980
Kingman	3	0	0	3	12,944
Kiowa	7	0	1	6	37,061
Lane	1	0	0	1	4,656
Leavenworth	6	0	1	5	7,998
Lincoln	1	0	0	1	4,144
McPherson	26	3	0	23	80,791
Marion	10	0	0	10	32,392
Marshall	1	0	0	1	2,175
Meade	1	0	0	1	6,265
Morris	3	0	0	3	7,787
Morton	1	0	0	1	4,731
Nemaha	2	0	0	2	6,547
Ness	5	2	0	3	23,453
Norton	6	0	0	6	22,732
Osage	1	0	0	1	1,610
Osborne	3	0	0	3	11,249
Ottawa	3	0	0	3	10,627
Pawnee	2	0	0	2	9,117
Phillips	5	0	0	5	18,325
Pratt	22	3	0	19	101,797
Rawlins	1	0	0	1	5,219
Reno	17	0	0	17	70,694
Rice	16	1	0	15	55,525
Rooks	21	5	0	16	76,655
Rush	9	0	0	9	33,176
Russell	16	3	0	13	52,991
Saline	15	0	0	15	47,304
Scott	1	0	0	1	4,770
Sedgwick	20	1	1	18	69,749
Shawnee	2	0	0	2	5,658
Sheridan	3	1	0	2	12,842
Smith	1	0	0	1	4,007
Stafford	36	10	0	26	137,140
Sumner	7	1	0	6	28,975
Trego	12	1	0	11	51,770
Wallace	1	0	0	1	6,000
Woodson	1	0	0	1	1,518
Total	491	49	10	432	1,804,525

NEBRASKA, MISSOURI

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	1,970
February	2	2	0	0	4,547
March	1	0	0	1	480
April	1	0	0	1	2,124
May	2	1	1	0	1,983
June	1	0	1	0	200
July	5	2	0	3	8,779
August	1	0	0	1	1,453
September	10	4	0	6	19,376

Month—	Comp.	Oil	Gas	Dry	Footage
October	3	1	0	2	2,587
November	4	2	0	2	9,318
December	2	0	1	1	1,762
Total	33	12	3	18	54,579

ILLINOIS
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	18	1	0	17	44,196
February	10	0	0	10	23,632
March	10	0	0	10	19,412
April	16	0	0	16	40,727
May	13	0	0	13	28,343
June	42	3	0	39	74,795
July	29	3	0	26	67,014
August	37	8	0	29	71,296
September	16	0	0	16	40,135
October	22	0	0	22	46,881
November	26	1	0	25	58,969
December	40	6	0	34	108,305
Total	279	22	0	257	623,705

ILLINOIS
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	110	77	0	33	284,879
February	120	86	0	34	287,837
March	103	69	1	33	254,832
April	123	87	1	35	319,676
May	124	79	1	44	205,768
June	132	108	0	24	421,554
July	176	115	0	61	484,732
August	145	102	0	43	400,508
September	178	125	1	52	470,841
October	156	104	1	51	416,462
November	174	126	0	48	448,672
December	129	96	1	32	338,108
Total	1,670	1,174	6	490	4,333,869

ILLINOIS
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	128	78	0	50	329,075
February	130	86	0	44	311,469
March	113	69	1	43	274,244
April	139	87	1	51	360,403
May	137	79	1	57	234,111
June	174	111	0	63	496,349
July	205	118	0	87	551,746
August	182	110	0	72	471,804
September	194	125	1	68	510,976
October	178	104	1	73	463,343
November	200	127	0	73	507,641
December	169	102	1	66	446,413
Total	1,949	1,196	6	747	4,957,574

ILLINOIS
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Albion and E.	79	62	0	17	9,298
Allendale	23	15	0	8	795
Beaver Creek	9	7	0	2	172
Belle Prairie	6	3	0	3	308
Bennington and S.	7	3	0	4	284
Benton and N.	9	8	0	1	325
Bible Grove	64	56	0	8	6,270
Blairsville	8	7	0	1	367
Boyd	16	15	0	1	2,949
Boyleston	17	9	0	8	1,082
Browns	23	17	0	6	3,089
Bungay	24	19	0	5	2,577
Burnt Prairie	18	12	0	6	2,552
Calhoun	7	6	0	1	1,802
Calvin North	14	11	0	3	1,400
Centerville E.	6	3	0	3	157
Cisne and N.	7	1	0	6	11
Clay City	207	179	0	28	17,804
Coil and W.	14	8	0	6	961
Concord and S	46	37	0	9	7,263
Covington and S	6	5	0	1	673
Dale-Hoodville	27	21	0	6	1,639
Divide and W.	27	20	0	7	2,409
Dundas and E.	6	2	0	4	32
Dupo	5	4	0	1	177
Flora	6	4	0	2	281
Friendsville	9	7	0	2	767
Geff	10	7	0	3	729
Golden Gate	13	11	0	2	1,664
Gossett	7	4	0	3	338
Herald	15	5	0	10	280
Inman East	21	17	0	4	1,215
Iola	28	24	0	4	1,093
Iron	5	3	0	2	100
Keensburg and S	16	7	0	9	471
Kenner	18	16	0	2	778
King	11	6	0	5	887
Lancaster and W	51	37	0	14	5,117
Lawrence	25	12	0	13	259
Maple Grove and E	8	7	0	1	623
Marine	25	20	0	5	3,223
Markham City and N	17	9	0	8	3,901
Mason and S.	8	2	0	6	285
Mattoon	8	6	0	2	240
Maunee and N	10	6	0	4	155
Mill Shoals	27	20	0	7	1,772
Mt. Carmel	55	44	2	9	3,625
Mount Erie, N and S	23	14	0	9	2,621
Mount Vernon	6	1	0	5	143
New Harmony	12	8	0	4	551
New Haven, N and W	18	9	0	9	987
Noble	40	29	1	10	6,059
Olney	8	4	0	4	624
Patoka	17	15	0	2	271
Patton and W.	37	23	0	14	6,301
Phillipstown	72	60	0	12	5,242
Roaches N	31	28	0	3	3,115
Roland	18	14	0	4	1,807
Rural Hill	14	8	0	6	362
St. Jacob	10	10	0	0	1,038
Sailor Springs and E	45	38	0	7	1,983
Salem	16	9	0	7	545
Schnell	31	27	0	4	9,810
Sims and N	12	8	0	4	430
South Johnson	11	7	0	4	66
Stokes	9	3	0	6	234
Storms	5	5	0	0	403
Walpole	13	5	0	8	337
West Frankfort and S	10	5	0	5	325
Whittington and W	5	2	0	3	92
Miscellaneous	139	38	3	98	3,789
Wildcats	279	22	0	257	3,512
Total	1,949	1,196	6	747	142,846

ILLINOIS
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Alexander	1	0	0	1	342
Bond	7	0	0	7	9,517
Clark	8	0	0	8	6,820
Clay	10	1	0	9	23,757
Clinton	11	1	0	10	11,465
Coles	1	0	0	1	475
Crawford	1	0	0	1	2,674
Cumberland	2	0	0	2	2,259
Douglas	1	0	0	1	834
Edwards	16	2	0	14	45,173
Effingham	11	0	0	11	26,089
Fayette	8	0	0	8	14,037
Ford	2	0	0	2	1,038
Franklin	14	4	0	10	39,861
Gallatin	6	1	0	5	14,801
Greene	2	0	0	2	2,210
Hamilton	18	2	0	16	64,492
Hancock	2	0	0	2	3,949
Hardin	1	0	0	1	3,306
Henderson	2	0	0	2	1,399
Jackson	1	0	0	1	3,582
Jasper	10	1	0	9	33,486
Jefferson	19	3	0	16	50,143
Kendall	2	0	0	2	4,556
Lawrence	13	1	0	12	24,565
Macoupin	2	1	0	1	2,722
Madison	8	1	0	7	13,381
Marion	9	0	0	9	21,463
McDonough	3	0	0	3	2,429
Monroe	1	0	0	1	904
Montgomery	6	0	0	6	4,101
Perry	3	0	0	3	5,488
Pike	2	0	0	2	3,806
Randolph	2	0	0	2	1,184
Richland	11	1	0	10	30,940
Saline	3	0	0	3	3,562
Schuyler	4	0	0	4	2,853
Shelby	4	0	0	4	8,217
St. Clair	4	0	0	4	3,382
Union	1	0	0	1	1,949
Wabash	10	1	0	9	29,048
Washington	6	0	0	6	9,187
Wayne	13	1	0	12	35,671
White	12	1	0	11	37,566
Will	1	0	0	1	1,958
Williamson	3	0	0	3	7,064
Total	279	22	0	257	623,705

INDIANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	3	0	0	3	6,420
February	1	0	0	1	2,300
March	0	0	0	0	0
April	5	2	0	3	11,476
May	2	0	0	2	4,617
June	4	1	0	3	9,790
July	2	0	0	2	5,324
August	5	0	0	5	5,902
September	2	1	0	1	4,170
October	1	0	0	1	536
November	4	0	0	4	9,415
December	4	0	0	4	7,653
Total	33	4	0	29	67,803

INDIANA
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	27	16	3	8	48,747
February	21	13	1	7	39,756
March	19	10	1	8	39,958
April	11	8	0	3	24,799
May	19	9	1	9	36,387
June	11	4	1	6	16,781
July	28	11	4	13	46,563
August	23	13	6	4	43,830
September	44	20	2	22	95,087
October	29	16	2	11	57,837
November	17	7	0	10	27,350
December	21	13	1	7	36,699
Total	270	140	22	108	513,794

INDIANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	30	16	3	11	55,167
February	22	13	1	8	42,056
March	19	10	1	8	39,958
April	16	10	0	6	36,275
May	21	9	1	11	41,004
June	15	5	1	9	26,571
July	30	11	4	15	51,887
August	28	13	6	9	49,732
September	46	21	2	23	99,257
October	30	16	2	12	58,373
November	21	7	0	14	36,765
December	25	13	1	11	44,352
Total	303	144	22	137	581,397

INDIANA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Daviess	1	0	0	1	770
Gibson	2	0	0	2	4,229
Jay	1	0	0	1	1,225
Knox	2	2	0	0	3,287
Orange	1	0	0	1	1,310
Owen	1	0	0	1	2,583
Pike	1	1	0	0	1,139
Posey	10	1	0	9	28,008
Randolph	1	0	0	1	1,095
Spencer	4	0	0	4	5,410
Sullivan	3	0	0	3	8,102
Vanderburgh	2	0	0	2	4,901
Warrick	1	0	0	1	1,912
Wells	3	0	0	3	3,632
Total	33	4	0	29	67,603

EASTERN
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry*	Footage
January	446	153	121	172	750,000
February	483	181	99	203	788,000
March	466	161	121	184	780,000
April	469	177	91	201	779,000
May	536	198	124	214	888,000
June	591	238	114	239	973,000
July	608	237	128	243	1,018,000
August	642	259	123	260	1,057,000
September	637	265	107	265	1,049,000
October	647	252	143	252	1,073,000
November	586	230	150	206	994,000
December	432	159	101	172	808,000
Total	6,543	2,510	1,422	2,611	10,957,000

*Includes 2,156 input wells.

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EASTERN KENTUCKY
Total Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Bath	2	2	0	0	180
Clay	4	0	4	0	3,970
Elliott	20	20	0	0	23,644
Floyd	55	1	46	8	124,924
Jackson	1	0	1	0	1,000
Johnson	21	2	14	5	42,360
Knott	45	0	35	10	93,486
Knox	1	1	0	0	850
Lee	5	4	0	1	4,036
Magoffin	15	2	11	2	21,476
Martin	73	8	58	7	103,915
Menifee	5	1	1	3	2,000
Pike	156	1	129	26	388,124
Powell	2	2	0	0	1,700
Wolf	7	2	3	2	2,350
Total	412	46	302	64	814,015

WESTERN KENTUCKY
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	6	0	0	6	15,408
February	3	0	0	3	8,526
March	4	1	0	3	7,234
April	6	3	0	3	14,083
May	3	0	0	3	7,812
June	7	0	0	7	16,518
July	10	1	0	9	19,074
August	18	2	0	16	35,880
September	16	6	0	10	22,214
October	8	0	0	8	20,091
November	8	2	0	6	18,808
December	11	2	0	9	25,605
Total	100	17	0	83	211,253

WESTERN KENTUCKY
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	34	19	0	15	55,701
February	34	19	1	14	58,986
March	31	20	0	11	51,673
April	26	10	1	15	42,767
May	35	27	0	8	62,619
June	50	33	0	17	86,888
July	42	29	0	13	78,032
August	41	37	0	4	68,150
September	55	38	0	17	95,985
October	55	32	0	23	97,606
November	43	24	0	19	73,967
December	35	23	1	11	64,909
Total	481	311	3	167	837,283

WESTERN KENTUCKY
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	40	19	0	21	71,109
February	37	19	1	17	67,512
March	35	21	0	14	58,907
April	32	13	1	18	56,850
May	38	27	0	11	70,431
June	57	33	0	24	103,406
July	52	30	0	22	97,106
August	59	39	0	20	104,030
September	71	44	0	27	118,199
October	63	32	0	31	117,697
November	51	26	0	25	92,775
December	46	25	1	20	90,514
Total 1944	581	328	3	250	1,049,111

WESTERN KENTUCKY
Total Completions by Counties

County—	Comp.	Oil	Gas	Dry	Prod.
Breckenridge	1	0	0	1	0
Butler	47	31	0	16	541
Christian	1	0	0	1	0
Caldwell	1	0	0	1	0
Crittenden	2	0	0	2	0
Daviess	51	19	1	31	984
Edmonson	3	0	0	3	0
Grayson	1	0	0	1	0
Hancock	4	1	0	3	15
Hardin	1	0	0	1	0
Henderson	107	50	0	57	5,108
Hopkins	9	1	0	8	7
Larue	3	0	0	3	0
McLean	16	1	0	15	20
Muhlenburg	5	0	0	5	0
Ohio	25	6	1	18	73
Todd	3	0	0	3	0
Union	215	171	1	43	35,640
Webster	86	48	0	38	4,507
Total 1944	581	328	3	250	46,895

WESTERN KENTUCKY
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Barren	1	0	0	1	404
Butler	3	0	0	3	3,101
Caldwell	1	0	0	1	1,290
Daviess	12	2	0	10	20,617
Edmondson	1	0	0	1	1,336
Henderson	32	4	0	28	73,753
Hopkins	5	0	0	5	13,256
McLean	4	0	0	4	8,702
Muhlenberg	1	0	0	1	455
Ohio	3	0	0	3	5,834
Todd	2	0	0	2	2,615
Union	23	7	0	16	54,776
Webster	12	4	0	8	25,114
Total	100	17	0	83	211,253

MICHIGAN
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	3	0	11	43,076
February	25	1	0	24	75,218
March	18	1	0	17	38,747
April	15	1	0	14	34,548
May	23	0	0	23	59,496
June	15	1	0	14	45,336
July	21	0	0	21	50,691
August	22	3	1	18	57,552
September	20	1	0	19	47,985
October	23	0	1	22	56,934
November	13	0	1	12	38,605
December	17	1	0	16	46,678
Total	226	12	3	211	594,866

MICHIGAN
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	17	11	2	4	42,565
February	31	21	2	8	77,328
March	24	16	0	8	69,789
April	20	9	1	10	50,421
May	34	15	7	12	81,543

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Month—	Comp.	Oil	Gas	Dry	Footage
June	43	21	8	14	99,883
July	30	13	4	13	71,831
August	43	20	9	14	87,215
September	67	41	11	15	155,399
October	43	20	4	19	110,298
November	38	19	1	12	95,340
December	39	21	1	17	83,957
Total	429	227	56	146	1,025,569

MICHIGAN
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	31	14	2	15	85,641
February	56	22	2	32	152,546
March	42	17	0	25	106,536
April	35	10	1	24	84,969
May	57	15	7	35	141,039
June	58	22	8	28	145,219
July	51	13	4	34	122,522
August	65	23	10	32	144,767
September	87	42	11	34	203,384
October	66	20	5	41	167,232
November	51	19	8	24	133,945
December	56	22	1	33	130,635
Total	655	239	59	357	1,620,435

MICHIGAN
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Prod.
Adams, North	15	10	0	5	12,195
Bangor, N.&W.	13	7	0	6	252
Bellyachers	6	4	0	2	550
Bloomer	8	4	0	4	2,050
Breedsville	9	7	0	2	353
Coldwater	8	8	0	0	2,722
Cranberry Lake	13	1	10	2	100
Dalton	7	5	0	2	230
Deep River	25	15	0	10	19,697
Essexville	7	6	0	1	1,531
Evart, E. & W.	11	0	6	5	0
Fillmore	39	31	0	8	1,896
Fork	38	17	5	16	4,442
Goodwell	25	11	11	3	1,647
Hilliard	12	8	0	4	722
Hopkins	6	5	0	1	261
Ithaca	8	0	4	4	0
Kawkawlin	14	13	0	1	636
Monterey & S.	9	8	0	1	208
Norwich, East	14	11	1	2	1,707
Old Geneva	7	6	0	1	64
Rose Lake	12	8	0	4	1,033
Wise, South	5	4	0	1	652
Woodville	10	0	8	2	0
Miscellaneous	108	38	11	59	9,877
Total	429	227	56	146	62,825

MICHIGAN
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Allegan	30	4	0	26	58,325
Antrim	1	0	0	1	2,112
Arenac	10	1	0	9	27,652
Barry	1	0	0	1	1,807
Bay	5	2	0	3	17,125
Calhoun	1	0	0	1	1,587
Chippewa	1	0	0	1	1,050
Clare	5	0	0	5	18,377
Clinton	6	0	0	6	17,996
Genesee	3	0	0	3	6,784
Gladwin	3	0	0	3	12,142
Gratiot	9	0	0	9	23,029
Hillsdale	1	0	0	1	2,165
Huron	4	0	0	4	9,205
Ionia	4	0	0	4	10,883
Iosco	3	0	0	3	9,310
Isabella	16	3	0	13	44,360
Kalamazoo	4	0	0	4	5,394
Kent	4	0	0	4	9,974
Lake	3	0	0	3	9,427
Lapeer	2	0	0	2	6,090
Lenawee	2	0	0	2	5,360
Mason	2	0	0	2	5,224
Mecosta	16	0	1	15	47,778
Midland	3	0	0	3	11,748
Missaukee	5	0	0	5	17,016
Montcalm	7	2	0	5	14,264
Muskegon	3	0	0	3	5,840
Newaygo	15	0	1	14	40,671
Ogemaw	1	0	1	0	4,537
Oceana	1	0	0	1	3,400
Osceola	12	0	0	12	42,507
Ottawa	9	0	0	9	15,606
Roscommon	3	0	0	3	14,496
St. Clair	3	0	0	3	5,611
Saginaw	3	0	0	3	10,108
Sanilac	2	0	0	2	5,503
Tuscola	3	0	0	3	11,187
Van Buren	14	0	0	14	15,522
Wayne	1	0	0	1	4,050
Wexford	5	0	0	5	19,644
Total	226	12	3	211	594,866

OHIO
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	0	2	5	23,566
February	10	0	4	6	30,248
March	3	0	0	3	10,194
April	6	0	1	5	23,599
May	8	0	2	6	26,394
June	8	0	1	7	25,942
July	12	0	1	11	38,400
August	10	1	3	6	39,112
September	13	1	4	8	48,252
October	7	0	2	5	22,651
November	7	0	2	5	19,613
December	7	0	1	6	28,303
Total	98	2	23	73	336,274

OHIO
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	69	11	38	20	200,102
February	69	11	28	30	170,469
March	70	9	35	26	194,281
April	74	11	37	26	206,440
May	72	8	37	27	170,138
June	60	12	32	16	146,198
July	99	20	44	35	259,071
August	74	16	34	24	183,206
September	80	11	39	30	209,056
October	107	22	42	43	256,678
November	76	18	39	19	204,981
December	75	20	32	23	192,725
Total	925	169	437	319	2,393,345

OHIO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	76	11	40	25	223,668
February	79	11	32	36	200,717
March	73	9	35	29	204,475
April	80	11	38	31	230,039
May	80	8	39	33	196,532
June	68	12	33	23	172,140
July	111	20	45	46	297,471
August	84	17	37	30	222,318
September	93	12	43	38	257,308
October	114	22	44	48	279,329
November	83	18	41	24	224,594
December	82	20	33	29	221,028
Total	1,023	171	460	392	2,729,619

OHIO
Development Completions by Fields
(Including Wildcats)

Field—	Comp.	Oil	Gas	Dry	Prod.
Ashland-Lorain	302	27	143	132	409
Brush-Creek-Zanesville	118	13	58	47	373
Cambridge	182	31	75	76	565
Clayton	30	21	3	6	1,026
Lancaster	135	26	50	59	478
Mt. Vernon-Newark	76	29	15	32	607
Sandyville	75	0	63	12	0
Stewart	105	24	53	28	361
Total	1,023	171	460	392	3,819

OHIO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Ashland	3	0	0	3	9,206
Columbiana	1	0	1	0	3,596
Coshocton	8	0	0	8	29,213
Cuyahoga	1	0	0	1	3,518
Gallia	1	0	0	1	906
Geauga	3	0	0	3	11,061
Guernsey	1	0	0	1	3,869
Hocking	4	0	1	3	9,606
Holmes	6	0	2	4	21,184
Jackson	4	0	0	4	12,412
Knox	2	0	0	2	6,765
Lake	1	0	1	0	3,515
Lawrence	1	0	1	0	2,372
Lorain	12	1	4	7	30,718
Mahoning	2	0	0	2	8,388
Medina	10	0	2	8	31,972
Monroe	4	1	1	2	13,053
Morgan	7	0	4	3	26,357
Muskingum	8	0	0	8	33,183
Perry	2	0	0	2	7,352
Putnam	1	0	0	1	3,377
Richland	1	0	0	1	2,705
Stark	3	0	3	0	14,402
Summit	4	0	1	3	14,928
Tuscarawas	2	0	1	1	8,813
Washington	3	0	0	3	13,715
Wayne	3	0	1	2	10,088
Total	98	2	23	73	336,274

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Pipe-Line Program Depends on Pace of Military Operations

by Paul Reed

WITH the completion of the huge pipe-line construction programs in 1944 to provide for war requirements, the industry is directing attention to plans for similar large undertakings, generally regarded as postwar projects. However, if the war is prolonged, needs may arise for the laying of certain extensive lines, which would warrant utilizing critical materials.

In 1944 a total of approximately 6,000 miles of pipe were laid in the United States, consisting of 2,384 miles for crude oil, 216 miles for refined products and 3,400 miles for natural gas. While this is less than 8,760 miles laid in 1943 and 7,725 miles in 1942, it is clear that 1944 was a big pipe-line year. American organizations, both civilian and military, built approximately 4,500 miles of line of various kinds in foreign countries.

Concerning large future projects in the United States, there has been much discussion of plans to build natural-gas transmission lines from the Hugoton field of Kansas, Oklahoma and Texas. Two of these projects are likely to be started this year. So far the following proposals have been made: Pacific Lighting Corp. and Pacific Gas & Electric Co. have made preliminary plans for a 900-mile line of 26 to 27½-in. pipe from the Hugoton field to connections in southern California. American Light & Traction Co. is preparing to organize a company which may be named Wisconsin-Michigan Natural Gas Co. to build a transmission system to cost $70,000,000 to Milwaukee, Detroit and other cities in the Great Lakes area. Natural Gas Pipelines Co. of America has been endeavoring to overcome legal barriers in order to deliver gas in Wisconsin; if this can be done, it is expected that the capacity of the company's system would be increased by looping and additional compressors.

Hugoton Outlet Proposals

Other proposals for Hugoton outlets have been made by Phillips Petroleum Co. for a line to Kansas City and by Kansas Consolidated Natural Gas Co. for a line to Kansas City.

Outlets for the Gulf Coast gas fields have been discussed in terms of enlarging the capacity of Tennessee Gas & Transmission Co., first by additional compressors, and later by looping. Possible postwar conversion of one or both of the War Emergency Pipelines, Inc., trunk systems to natural gas would entail extensive construction of compressor stations and additional lines. The application of Consolidated Natural Gas Co. for a line from Gulf Coast gas fields is still on file with the Federal Power Commission.

The largest postwar crude-oil pipe-line projects being considered are those of Arabian American Oil Co. for a 1,050 to 1,100-mile system of 24-in. and 26-in. pipe from Saudi Arabia to Mediterranean ports to cost $100,000,000 and a 1,200-mile system for Iraq Petroleum Co., Ltd., to consist of 24-in. from the Kirkuk field to the junction near the Euphrates River and 20-in. branches from there to Haifa and Tripoli.

Lateral Program Extensive

When pipe is available, considerable construction of laterals for products pipe lines in the United States is anticipated to provide pipeline deliveries to numerous points.

Demand for steel for war purposes is likely to have a more stringent effect in restricting pipe-line construction in the immediate future than in the previous war years, when the steel industry demonstrated its capacity for making pipe for long, large-diameter lines in the 1942-44 period in spite of big munitions production. The WEP crude-oil system has a total of 1,460 miles, consisting of 1,258 miles of 24-in. and 202 miles of 7-in. to 20-in. pipe; the WEP products line has a total of 1,716 miles, consisting of 1,584 miles of 20-in. and 132 miles of 6 to 16-in. pipe; and Tennessee Gas & Transmission Co.'s system has 1,265 miles of 24-in. as well as gathering lines. These three government financed crude oil, products and natural-gas lines built in the war represent a total of 4,439 miles which showed ability to supply material for such big systems at the rate of approximately 1,800 miles per year when such lines appeared to be vitally needed for the war program.

Construction in 1944 started off with important projects for increasing crude-oil outlets from the West Texas producing area, including looping programs of Magnolia Pipe Line Co. and Gulf Refining Co. as well as the first 16-in. trunk line in the United States which was built by Stanolind Pipe Line Co. to Drumright, Okla. There has been much gathering line construction by major companies in West Texas as well as looping later in the year by Texas-New Mexico Pipe Line Co. and Stanolind to increase main-line capacity for moving West Texas crude.

In addition to West Texas, other active areas for crude-oil line construction have been in the Rocky Mountains where Elk Basin field outlets were provided by Stanolind's 232-mile 12-in. line to Casper, Wyo., and Yale Oil Pipelines, Inc., 80-mile 6-in. and 8-in. line, recently acquired by Leader Oil Co., a subsidiary of Carter Oil Co. On the Gulf Coast, numerous lines, mostly short lines, have been built.

The principal products pipe line has been Ohio Oil Co.'s Robinson, Ill.-Indianapolis, Ind., line. This and the Everett-Methuen, Mass., line of Colonial Beacon Oil Co., part of which is built jointly with Shell, was being laid at the end of the year. Phillips Petroleum Co. increased capacity of its 1,390-mile 8-in. trunk line by installing 16 pump units between Borger, Tex., and St. Louis, Mo.

Gas-Line Construction

Predominant in 1944 gas line construction was Tennessee Gas & Transmission Co.'s 1,265-mile 24-in. Texas-West Virginia system which led to the laying of laterals and to the looping of the systems in the north to which it was connected.

Following construction of the Cities Service Transportation & Chemical Co. Guymon-Blackwell, Okla., line, additional lines have been laid eastward in Oklahoma by Cities Service Gas Co. In California Southern California Gas Co. and Southern Counties Gas Co. laid lines to serve the Goleta underground storage program in a manner which is regarded as significant prepara-

UNITED STATES PIPE-LINE ACTIVITY
(Miles of pipe-line construction)

Year	Oil	Products	Natural gas	Total
1944	2,384	216	3,400	6,000
1943	3,925	3,622	310	8,760
1942	4,335	2,125	1,265	7,725

tion for facilitating transmission operations at a later time when a trunk line may be built to California from the Hugoton field.

Outside the United States, American civilian construction firms completed important projects. In the spring the Canol 600-mile 4½-in. o.d. crude-oil line in northern Canada and Yukon Territory, costing $50,635,000 was completed and put in operation. In the last half of the year, Creole Petroleum Corp. built a 116-mile 16-in. from Jusepin to Puerto la Cruz, Venezuela. The United States Army is building extensive 4-in. and 6-in. products lines which already total several thousand miles in the European theater of war alone as well as the India-Burma-China line which is to extend 1,850 miles when completed. In addition to these foreign undertakings of Americans, Soviet Russia engineers have completed a 450-mile natural-gas line from Saratov to Moscow and the British have built a 1,000-mile products system in England which has been under construction since 1941.

Significant demonstrations in 1944 which may influence future pipeline policies include those showing the utility of types of lines adopted for military service and the lesson given to the industry by the continued successful operation of the WEP big-inch lines, providing economical transportation for large volumes in an efficient manner resulting in earnings, according to Jesse Jones, of $100,000 daily.

Principal 1944 Projects

Crude-Oil Lines

Stanolind Pipe Line Co.—385 miles, 16-in., Slaughter, Tex.-Drumright, Okla.; 41 miles, 16-in. loops on main line between Drumright, Okla., and Sycamore, Kans.; 232 miles 12-in., Elk Basin-Casper, Wyo.; 31 miles, 12-in., Casper-Welch, Wyo. Total of these projects 689 miles.

Utah Oil Refining Co.—112 miles, 6-in. Iles Dome, Colo.-Wamsutter Station, Wyo. to connect with Ft. Laramie-Salt Lake City trunk line.

Yale Oil Pipelines, Inc.—80 miles, 6-in. and 8-in. Elk Basin-Laurel and Billings, Mont. Capacity 12,000 bbl., 6-in. section; 18,000 bbl., 8-in. section. Line is now owned by Leader Oil Co., subsidiary of Carter Oil Co.

Ohio Oil Co.—46 miles, 6-in., including Hamilton Dome to Frannie Station, Byron pool, Wyoming.

Magnolia Pipe Line Co.—337 miles, 12-in. Midland-Corsicana, Tex. Capacity 40,000-42,000 bbl. The project also includes a 46-mile, 8-in. Midland-Seminole, Tex., loop. Total 383 miles.

Gulf Refining Co.—75 miles, 10-in. Midland-Weatherford, Tex. loops on company's West Texas-Judkins, Tex. line; 13 miles, 8-in. Satillo-Big Sandy loop; 28 miles, 8-in. Big Sandy-Longview, Tex. Loops increase capacity 11,000 bbl. Big Sandy-Longview line capacity for delivery to WEP is 25,000 bbl. Also 63 miles, 8-in. Keystone pool-Midland, Tex. Total 179 miles.

Shell Pipe Line Corp.—66 miles of lines including: 28 miles, 4-in., 6-in., 8-in. and 10-in. in Wasson, Tex., area; 18 miles, 6-in. Wheeler-Monahans, Tex., line and gathering system; 7 miles, 4-in. Wynn pool-New York City station, Tex., 13 miles, 4-in., Pauls Valley, Okla., area.

Standish Pipe Line Co. (Phillips Petroleum Co.)—100 miles of gathering lines in Texas Panhandle; 16 miles, 8-in., Goldsmith, Tex., area. Sohio-Standish 15 miles, 8-in., West Edmond-Oklahoma City. Total 131 miles.

Texas-New Mexico Pipe Line Co.—30 miles 12-in. loops on main line at locations between Crane and Houston.

Sun Oil Co.—51 miles, 4-in., East Ranch, Guerra and Weil pools to Sun field, Starr County, Tex. Also 59 miles, 4-in. to 8-in. pipe for various locations.

Pan-American Pipe Line Co.—34 miles 8-in., Willamar-Port Isabel, Tex., capacity 10,000 bbl.; 6 miles, 6-in. Chocolate Bayou field-Alta Loma Junction, La. Total 40 miles.

The Texas Co.—58 miles, 10-in. Elk Hills-Cottonwood, Calif., connection with system of Valley Pipe Line Co.

Standard Oil Co. of California—42 miles 4-in. and 6-in. from Helm and Riverdale pools to Coalinga, Calif.

Union Oil Co. of California—46 miles, including: 37 miles, 10-in. and 12-in. Cat Canyon field-Santa Maria and Port San Luis; 9 miles, 8-in. Elk Basin-Midway.

Simrall Corp.—44 miles including several lines of 4-in. and 6-in. in Missaukee and Bay counties, Michigan.

Oklahoma Pipe Line Co. (now Interstate Oil Pipe Line Co.)—10 miles, 6-in., Eucutta-Hiwannee, Miss.; 16 miles, 8-in. Cranfield, Miss., to Mississippi River; 7 miles 8-in., Frannie, Wyo.-Warren, Mont.; total 33 miles.

Products Lines

Ohio Oil Co.—115 miles, 8-in., Robinson, Ill., to Indianapolis, capacity 16,000 bbl.

Texas Pipe Line Co.—34 miles, 6-in., Lockport, Ill.-East Chicago (Indian Harbor), Ind. Capacity 18,500 to 20,000 bbl.

Colonial Beacon Oil Co.—35 miles, 4-in. and 6-in., Everett - Waltham - Methuen, Mass. The Waltham-Methuen leg is being built jointly with Shell Oil Co., Inc.

U. S. Bureau of Mines—32 miles, 2-in. for transporting liquefied helium under 2,700-lb. pressure for Amarillo, Tex., facilities.

Natural Gas Lines

Tennessee Gas & Transmission Co.—1,265 miles, Driscoll-Texas-Cornwell, W. Va., line consisting of 1,180 miles of 24-in. and 85 miles of 20-in. Capacity with 7 initial compressor stations with 58,000 installed compressor horsepower, 207,000,000 cu. ft., with 14 ultimate stations with 118,000 hp., 225,000,000 to 300,000,000 cu. ft.

Hope Natural Gas Co. and New York State Natural Gas Co.—145 miles, 12¾-in., to Clarion, Pa., for transmitting 50,000,000 cu. ft. received from Tennessee Gas & Transmission Co. to upstate New York-Pennsylvania area.

United Natural Gas Co.—57 miles, 12-in. in western Pennsylvania to transmit gas delivered via Tennessee Gas & Transmission Co. system.

Manufacturers Light and Heat Co.—23 miles, 16-in., 5 miles, 12-in., total 28 miles, Marshall County, W. Va. - Washington County, Pa., to transmit gas from Tennessee Gas & Transmission Co.

Louisville Gas & Electric Co.—60 miles, 8-in. and 12-in. from Tennessee Gas & Transmission Co., Calvary, Ky., to Louisville.

Cities Service Co. and subsidiaries—Cities Service Transportation and Chemical Co., 230 miles, 26-in. Guymon-Blackwell, Okla., and gathering lines; Cities Service Gas Co., 35 miles, 12-in. loop, Burbank-Tallant, Okla., 11 miles, 20-in. loops south of Wichita. Original capacity of Guymon-Blackwell line increased from 140,000,000 cu. ft. to 213,000,000 cu. ft. Also 35 miles, 16-in. loop Blackwell-Burbank, Okla.; 43 miles, feeder lines at Guymon, 22 miles of various sizes for different fields; 52 miles, 16-in. Shidler, Okla.-Caney, Kans., and 6 miles, 16-in. for connections with underground storage reservoirs, in Kansas; 31 miles 16-in. Blackwell-Fairfax, Okla. Total 465 miles.

Phillips Petroleum Co.—219 miles of gas lines in West Texas and the Panhandle, including: 42 miles, 4-in. to 24-in., Dumas, Tex.; 80 miles, 4-in. to 20-in. Guymon, Okla., and Hansford, Tex.; 50 miles, 2-in. to 24-in., Fullerton, Tex.; 15 miles, 8-in., Goldsmith, Tex.; 32 miles, 12 to 20-in., Borger-Pampa area to carbon black plants.

Kansas-Nebraska Natural Gas Co., Inc.—156 miles, including 41 miles, 18-in.; 100 miles, 12¾-in.; 15 miles, 8⅝-in., Hugoton field-Stockton, Kans.

Haynesville Operating Committee—150 miles, 2-in. to 20-in. for Haynesville, La., unitized operations.

Celanese Corp. of America—90 miles, 24-in. to supply plant in Bishop, Tex., area.

United Gas Pipe Line Co.—18 miles, 12¾-in., De Large field, La., to company's Lirette-Mobile line. Completion date, September, 1944.

Interstate Natural Gas Co.—50 miles of 4-in., 8-in., 12-in., and 16-in. near Bastrop, La.

Consolidated Utilities Corp.—26 miles, including: 14 miles 6-in. loop near Sayre, Okla.; 10 miles, 7-in. and 8-in., for the Lawton-Duncan, Okla., system and 2 miles, 8-in. Blackwell, Okla.

Pacific Lighting Corp. subsidiaries—Total of 71 miles laid, including Southern California Gas Co.'s 10 miles, 22-in. and 27 miles, 18-in., Hollywood-Ventura and Southern Counties Gas. Co.'s 34 miles, 16-in., Ventura-Goleta, Calif., underground storage.

Planned for Early Construction

Crude Oil

Home Oil & Refining Co.—90 miles, 5-in. from Cut Bank and Pondera fields to the Home refinery at Great Falls, Mont.

Interstate Oil Pipe Line Co., 121 miles, 8-in., 10-in., and 12-in. oil lines for moving crude oil from Mississippi fields to Baton Rouge, La.

Products

Dow Chemical Co.—79 miles, 4-in. to transport liquefied petroleum gases from the Humble Oil & Refining Co. plant at Katy to the Dow plant at Freeport, Tex.

Natural Gas

United Carbon Co. (Defense Plant Corp.)—93 miles consisting of 42 miles, 24-in. and 26-in. and 51 miles, 8-in., 10-in., and 12-in. to supply two carbon black plants being built near Odessa, Tex.

Memphis Natural Gas Co.—61 miles, 18-in. loops on main line and 50 miles, 20-in., Guthrie-Lisbon, La. Total 111 miles.

Phillips Petroleum Co.—100 miles for two projects: 30 miles of 24-in. from the Borger-Dumas area to carbon black plants; and 70 miles of 2-in. to 20-in. for a wet gas gathering system in the West Edmond field, Oklahoma.

Union Gas Co. of Canada, Ltd.—70 miles of line to cost $3,000,000 from Detroit, Mich., to Dawn field, Ontario, underground storage.

The Volume per Thousand Cubic Feet of Gas

Mechanics of Producing Oil, Condensate, and Natural Gas

*by Park J. Jones**

PART 13 IN A SERIES

Other things equal, the quantity of gas in a reservoir is inversely proportional to the volume of the gas. The volume factor for a gas is the space occupied by the gas per unit volume. For production purposes, the unit of space is expressed in barrels. But the unit of volume, when working with gases, may be either in terms of M.c.f. of gas or barrels of liquid in the gas. The liquid may be oil, product, or condensate. In this article, the procedure for estimating volume factors in terms of M.c.f.'s is derived and illustrated by examples.

THE relationship between pressure, volume, temperature, and weight of a gas is customarily expressed by

$$PV = Z\,(W/M)\,RT = ZNRT \quad (1)$$

Where

P = pressure, p.s.i.a.
V = volume, cubic feet
Z = compressibility factor, no dimensions
W = weight of gas, pounds
M = molecular weight of gas, pounds per mole
R = gas constant, 10.72 for one mole of any gas
T = absolute temperature, °F.+ 460, °R.
N = W/M, number of pound moles.

If the volume of a gas at standard conditions is denoted by V_o, the volume I of an ideal gas at any pressure and temperature is defined by

$$I = V_o\,(14.73/P)\,(T/520)$$

and the volume A of an actual gas by

$$A = V_o\,(14.73/P)\,(T/520)Z$$

Combining the foregoing equations, we get

$$Z = A/I$$

Therefore, the compressibility factor is the volume of a gas at a given pressure and temperature divided by the volume of an ideal gas at the same pressure and temperature. As the compressibility factor is a ratio, it has no dimensions.

Specific Volume and Weight

As one mole of gas at 14.73 p.s.i.a. and 60° F. occupies 379 cu. ft., it follows from equation (1) that specific volume in cubic feet per pound is defined by

$$V/W = PM/(10.72TZ)$$

Similarly, the specific weight of a gas in pounds per cubic feet is defined by

$$W/V = (10.72TZ)/PM$$

Critical Pressure and Temperature

The critical temperature is that temperature above which a one-component gas cannot be liquefied by pressure alone. The pressure under which a pure substance may exist as a gas in equilibrium with its liquid at the critical temperature is the critical pressure. Table 13-1 gives the National Gasoline Association of America data on critical pressure and temperature commonly used in practice. The critical pressure and temperature of a constituent in a gas is denoted by P_c and T_c respectively.

Pseudo Critical Pressure and Temperature

The pseudo critical pressure P_r of a gas is defined by

$$P_r = \Sigma\,(YP_c)_i \quad (2)$$

and the corresponding pseudo critical temperature, by

$$T_r = \Sigma\,(YT_c)_i \quad (3)$$

where Y is the mole fraction of a constituent in a gas. A computation of the pseudo criticals for a gas is

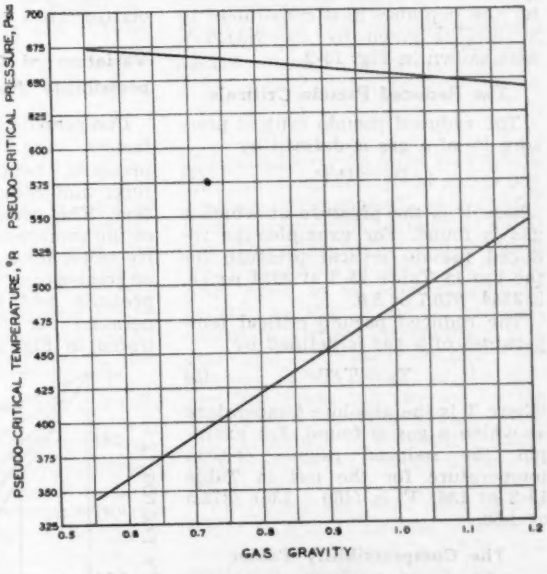

Fig. 13-1: Approximate pseudo-criticals vs. gravity. (N.G.A.A. data)

*Production consultant, Houston.

TABLE 13-1—CRITICAL PRESSURE AND TEMPERATURE*

Constituent—	Critical pressure (p.s.i.a.)	Critical temp. (°R)
Methane	673	344
Ethane	712	550
Propane	617	666
Isobutane	528	734
n-Butane	551	766
Butanes (Gulf Coast)	547	749
Butanes (Mid-Continent)	546	744
Isopentane	483	830
n-Pentane	485	846
Pentanes	484	838
Hexanes	443	908
Heptanes (low content)	430	1010
Heptanes (high content)	Fig. 13-2	Fig. 13-2
Air	546	238
Nitrogen	492	227
Oxygen	731	278
Carbon dioxide	1072	548
Hydrogen sulfide	1307	673

TABLE 13-2—ILLUSTRATING A COMPUTATION OF PSEUDO CRITICALS

Constituent—	Mole (per cent)	P_c (p.s.i.a.)	T_c (°R)	Mole fraction times P_c	Mole fraction times T_c
Methane	90.00	673	344	605.7	309.6
Ethane	6.00	712	550	42.7	33.0
Propane	2.00	617	666	12.3	13.3
i-Butane	0.50	528	734	2.6	3.7
n-Butane	0.50	551	766	2.6	4.5
i-Pentane	0.40	483	830	1.9	3.3
n-Pentane	0.40	485	846	1.9	3.4
Hexanes+	0.20	484	838	1.0	1.7
	100.00			$P_r = 670.7$	$372.5 = T_r$

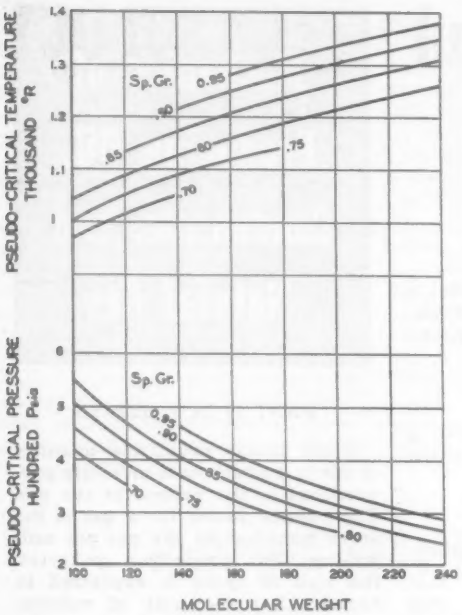

Fig. 13-2: Pseudo-criticals vs. molecular weight and specific gravity for heptanes plus. (N.G.A.A. data)

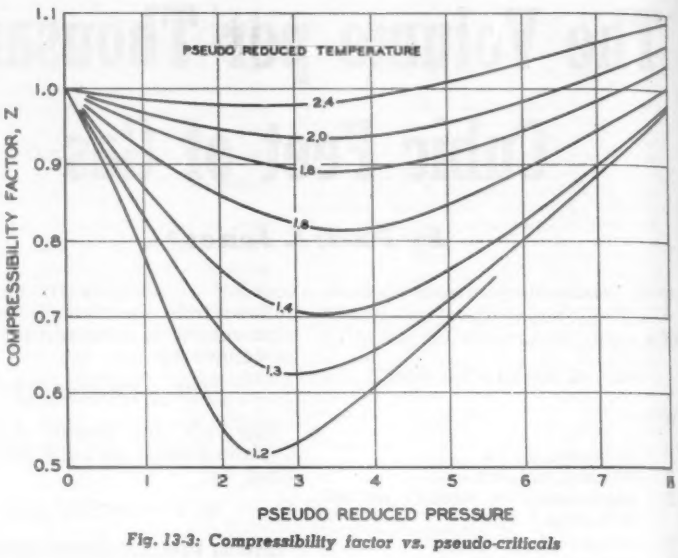

Fig. 13-3: Compressibility factor vs. pseudo-criticals

illustrated in Table 13-2. On the other hand, the approximate pseudo criticals may be obtained directly from Fig. 13-1 if the gravity of a gas is known. The pseudo criticals for the heptanes plus constituent in a fluid is given by the N.G.A.A. data shown in Fig. 13-2.

The Reduced Pseudo Criticals

The reduced pseudo critical pressure P_R of a gas is defined by

$$P_R = P/P_r \qquad (4)$$

where P is the pressure at which a gas is found. For example, the reduced pseudo critical pressure for the gas in Table 13-2 at 3354 p.s.i.a. is 3354/ 670.7 or 5.0.

The reduced pseudo critical temperature of a gas is defined by

$$T_R = T/T_r \qquad (5)$$

where T is the absolute temperature at which a gas is found. For example, the reduced pseudo critical temperature for the gas in Table 13-2 at 136° F. is (460 + 136) /372.5 or 1.60.

The Compressibility Factor

The compressibility factor for a gas may be expressed in terms of pseudo criticals. This was first proposed by Kay* and later verified by others. Fig. 13-3 illustrates the relationship between compressibility factors and pseudo reduced criticals. This graph may be obtained from N.G.A.A.

As an illustrative example, the compressibility factor for the gas in Table 13-2 at 3354 p.s.i.a. and 136° F. is 0.847. This means that one M.c.f. of the gas under consideration occupies 847 cu. ft. where 1 M.c.f. of an ideal gas would occupy 1,000 cu. ft.

*Kay, W. B., IEC, 28, 1014, (1936).

Variation of Compressibility Factors

Compressibility factors vary with pressure, temperature, and composition. The variation of the compressibility factor for a given composition with pressure and temperature is illustrated in Fig. 13-4.

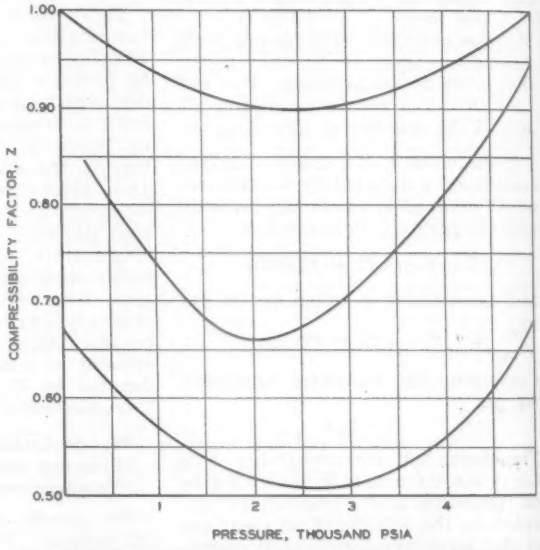

Fig. 13-5: Compressibility factor vs. pressure at 200°F. for three different compositions

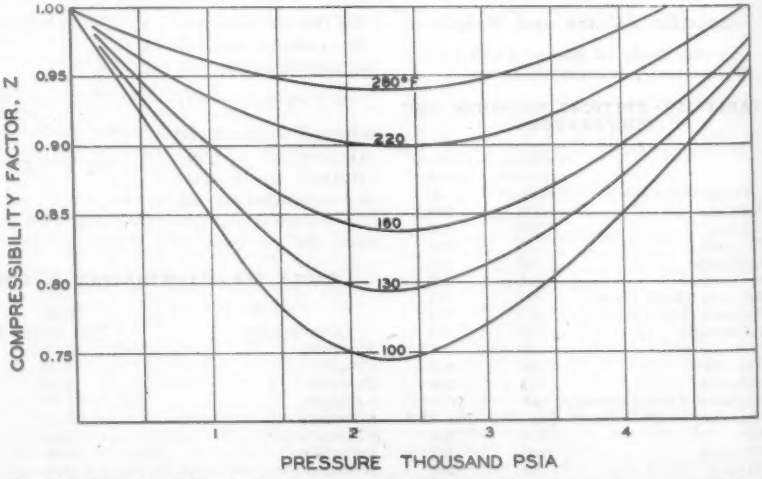

Fig. 13-4: Compressibility factor vs. pressure and temperature for a given composition. (Data by Sage and Reamer)

The variation of compressibility factors with pressure at 200° F. for three different compositions is illustrated in Fig. 13-5.

Volume Factor Per M.c.f. of Gas

The volume factor for a gas is the space occupied by the gas per unit volume. For production purposes, the unit of space is expressed in barrels. But the unit of volume, when working with gases, may be either in terms of M.c.f. of gas or barrels of liquid in the gas. The liquid may be oil, product, or condensate.

In terms of M.c.f.'s, a volume factor is the number of barrels of reservoir space required to hold 1 M.c.f. of gas. In terms of these units a volume factor for a gas is defined by

$$B = (1{,}000/5.615)\,(14.73/520)\,(TZ/P) = 5.04\,TZ/P \qquad (6)$$

where

P = average reservoir pressure, p.s.i.a.
T = absolute reservoir temperature, °R.
Z = compressibility factor
B = volume factor, barrels space per M.c.f. of gas.

Example: Estimate the volume factor for the gas in Table 13-2 if the average reservoir pressure is 3,354 p.s.i.a. and the temperature, 136°F. Solution

$$B = (5.04)\,(596 \times 0.847)/3354 = 0.758$$

In this example, 0.758 bbl. of reservoir space are required to hold 1 M.c.f. of gas.

Reservoir space is defined by

$$S = 7758\,a\,h\,f\,(1 - W) \qquad (7)$$

where

a = productive acreage
h = average pay thickness for "a", feet
f = average porosity for "ah", fraction
W = average interstitial water for "ahf", fraction of "f"
S = reservoir space, barrels.

The number of M.c.f. in place is equal to S/B. For example, a gas reservoir contains 129,000 acre-feet of reservoir space which is 10,000,000 bbl. of reservoir space. If the volume factor for the gas in place is 0.758, there are approximately 13,200,000 M.c.f. in place.

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4. Standing and Katz, A.I.M.E., TP No. 1323.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

W. L. NELSON

This department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in various phases of plant operation, as well as those connected with the marketing and utilization of petroleum products. Readers are invited to submit their problems to W. L. Nelson, technical editor. Inquiries must be signed, but only the initials will be printed.

Contamination of Gasoline by Rubber

We have been having trouble with gum in our gasoline at the station. We think it is due to the rubber hose used on the station pump. Where can we get information on the hose? —I. F. G.

Obviously the thing to do is to test some of the gasoline to see if it contains materials extracted from the hose. Such an experiment would be simplier than a thorough study of the technical literature.

The resistance of rubber and synthetic rubbers to the action of solvents has been thoroughly studied but attention has been centered almost completely on the damage done to the rubber rather than on the deterioraton of the gasoline by contact with rubber. The resistance of certain rubber-like materials to swelling in gasoline and solvents is somewhat as follows: E means excellent, G good, F fair, and P poor.

	Rubber	Neoprene	Thiokol	Perbunan	Ameripol oil resist.
Chlorinated or aromatic solvents	P	P	G	P	F
Lacquer solvents	P	P	G	P	F
Mineral oil or gasoline	P	G	E	G to E	E

The aniline point and diesel index of the gasoline (or kerosene) are good indications of the amount of swelling produced, at least with respect to neoprene. Gasolines are worse than kerosene and cracked gasolines are worse than straightrun gasolines. A few references to the swelling produced by oils and gasolines are given at the end of this item.

Methods of studying the residues that may be found in a gasoline that has been used in contact with rubber, have not been standardized. The contamination is small in most cases and a long exposure of the gasoline to the rubber is necessary at room temperature. Whether or not high-temperature extraction tests for short periods of time duplicate actual conditions is not certain. In the paper, entitled "A Survey of Gum Residue Test Methods for Fuel-Resistant Synthetic Rubber Materials", by Jules I. Wittebort, published in the A.S.T.M. Bulletin of October 1944, the following procedure is recommended:

"A 5-g. sample of the synthetic rubber material is diced into 1/16-in. cubes, weighed to nearest 0.001 g., placed in a Sohxlet extractor or similar extraction apparatus, and extracted for 24 hours with 150 ml. of boiling A.S.T.M. precipitation naphtha (Standard Method of Test for Precipitation Number of Lubricating Oils (D91-40), 1942 Book of A.S.T.M. Standards, Part III, p. 196) in much the same manner as acetone extractions are carried out. Portions of the extraction fluids are then poured into a brightly polished copper dish, recently weighed, and placed over an open steam bath until the total amount of extraction medium is evaporated, as indicated by the absence of the odor of naphtha. The copper dish and contents are then removed from the steam bath, dried in an oven maintained at 212° to 220° F. for 30 minutes, cooled to a room temperature in a desiccator, and finally weighed. The increase in the weight of the copper dish times 100, divided by the weight of the original sample, gives the percentage of extractible materials contained in the synthetic rubber sample."

In connection with this test it might be wise to use the gasoline in question rather than A.S.T.M. precipitation naphtha. Other methods are discussed including a 48-hour room-temperature test, but it is necessary to use aromatic hydrocarbon solvents to extract the soluble materials from the rubber and hence it would seem to be more of a test of rubber than a test of solvent power.

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Products on Neoprene Vulcanizates, Ind. Eng. Chem. 35, 947 (1943).
3. Norman, H. S.—Oil's Rubber Plantation to Supply Wartime Demand, The Oil and Gas Journal, pg. 24, March 12, 1942.
4. Pryor, C. C.—Neoprene—A Construction Material for Petroleum Industry Equipment, Petroleum Engineer, pg. 27, Dec. 1942.

Diesel Engine Lubricating Oils

I have been referred to you as a source of information on several problems relating to diesel engines, as: (1) What are the causes of bearing failure, what metals are used, what can be done to prevent bearing failure, etc.? (2) Lubricating oil, how is it prepared, what causes gum formation, what detergents are used and why, how prevent carbon formation, what makes the lubricating oil acid?—V.B.F.

Almost certainly recourse to a test engine in which each oil is tested must be made. These questions truthfully exhibit the fog of confusion that surrounds the operation and particularly the lubrication of diesel engines. Much of the confusion stems from the fact that paraffin-base oils have been considered as "above reproach". In addition, engine designs have been changed in the last few years toward closer clearances and toward higher temperatures. The very high temperatures in diesel engines necessitate an entirely new conception of lubricating oils. Finally, the routine or control tests used by refiners to classify lubricating oils are not well adapted for judging the performance characteristics of the oils.

At conditions of high temperature, and oxidation in the presence of metals, paraffin-base bright stock oils tend to thicken until eventually they are converted into a solid asphalt-like material (J. Faust—Asphaltization Tests for Lubricating Oils, The Oil and Gas Journal, page 29, January 20, 1944), whereas overhead distillates and some Mid-Continent oils form a hard granular carbon without increasing much in viscosity. The general behavior of these two kinds of oils in diesel engines indicates that the asphalt-forming oils produce hard engine deposits particularly on the rings, and that the carbon-forming oils give a reasonably clean engine because the carbon is suspended in the oil and is carried to the oil filters.

Likewise the tendency to cause corrosion is not clear. According to J. W. Poole (Evaluating Petroleum Lubricants, Petroleum Engineer, Annual Number, page 175, 1942), "corrosion tendencies cannot be determined merely by knowing the oil type; but the overwhelming majority of highly corrosive oils have also been paraffinic."

These points are not made for the purpose of discrediting paraffin-base oils because they have some very real advantages, but as a grave suggestion that the situation must be approached carefully and with an entirely open mind, one not cluttered with the preconceived ideas that are prevalent among even highly skilled technical men.

Final evidence of the confusion about diesel oils is the literature on the subject, voluminous but without much in the way of practical answers. The questions are too complicated for this page and it is not certain that correct answers can, at our present state of development, be given. Refer to the articles mentioned above and also to the references given at the end of this discussion. Twenty-eight additional references are given on the Questions on Technology page of November 12, 1942, issue (page 234). The new book entitled, "Lubrication of Industrial and Marine Machinery", John Wiley & Sons, N.Y., 1943, by W. G. Forbes, is excellent. Additional information on manufacture is available in "Petroleum Refinery Engineering," McGraw - Hill Book Co., N.Y.

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13. Rescoria, Carnahan & Fenske—Development of Acidity in Certain Lubricating Oils on Use and Oxidation, Ind. Eng. Chem. Anal. Ed. 9,574, 1937.
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17. Waters & Larson — The Laboratory Evaluation of the Potential Service Performance of Lubricating Oils, A.C.S. Meeting, Detroit, April 1943.
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BOOKS

SETTING UP AND OPERATING A WELDING BUSINESS. Published by The James F. Lincoln Arc Welding Corp., Cleveland, Ohio. 100 pp.

This booklet contains helpful suggestions for the person contemplating the establishment and operation of a welding business. The material consists of three award-winning studies from Foundation-award programs: "Developing and Constructing a Commercial Welding or Job Shop," by Fred H. Drewes; "How to Use the Arc to Increase Business in the Garage," by E. W. Weinberger, and "Organization of Garage or Service Station Is Arc Welded," by Clarence McClellen.

COMMERCIAL WAXES, NATURAL AND SYNTHETIC. Edited by H. Bennett. Chemical Publishing Co., 26 Court St., Brooklyn, N. Y. 1944. $11.

All classes of waxes, such as mineral, vegetable, animal, insect, synthetic, and compounded waxes are discussed in detail. The various data such as melting point, form and fracture, purity, hardness, flexibility, moldability, adhesiveness, solubility and many other properties, including sources and uses, are all listed in this study. It includes a glossary of terms and wax formulary giving the most useful formulas of commercial materials containing waxes, agricultural specialties, materials of construction, protective and decorative coatings, soaps and cleaners, etc.

THE FOREMEN'S GUIDE TO LABOR RELATIONS. Bulletin No. 66 of United States Department of Labor, Division of Labor Standards, Washington, D. C. 28 pp.

The purpose of this guide is primarily to provide the foreman with a background in the field of labor relations. It should help him develop a constructive and flexible approach to the specific human problems which he meets in the course of daily departmental operations. The guide also attempts to give the foreman a better understanding of the position he holds as direct representative of management in all matters involving the application of the company's labor-relations program.

Walter E. Wanner, assistant superintendent of the Olean, N. Y., refinery of Socony-Vacuum Oil Co., Inc., since 1930, has been promoted to superintendent, succeeding **J. F. Turner,** who retired after 40 years of service. **B. L. Harris** takes Wanner's place as assistant superintendent. Wanner, a Cornell University graduate in mechanical engineering, went to work at the Olean refinery in 1916. Harris, who graduated from Amherst College in 1910, has been assistant to the superintendent at Olean since 1930.

Russell A. Farmer, formerly district geologist at Tyler, Tex., for Stanolind Oil & Gas Co., has been transferred to Midland, West Texas, succeeding **W. D. Henderson,** who was moved to Fort Worth. **G. T. Buskirk** has taken Farmer's place at Tyler.

Nathaniel H. Benninger, of Clarion, Pa., veteran of almost 38 years' continuous service with United Natural Gas Co. and foreman of the company's Clarion field, retired from active service January 1.

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Cost of Topping

REFINER'S Notebook Nos. 19, 23, and 25 on Topping Plant Flow (November 25, 1944), Combination Plants (December 23, 1944), and Straight-Run Aviation Gasoline (January 6, 1945) indicates a large variety of ways that topping can be conducted. Corrosion also introduces complications (No. 22 of December 16, 1944, on Hazards and Corrosion) and finally variations in crude oils (Nos. 9, 11, 13, 15, 17, and 20) required different processing conditions in each plant. All of these factors influence the cost of operating a topping plant and together they produce a 10-fold range of cost.

Total costs are shown in Table 1 for the extreme of a (1) well-operated simple large plant, and (2) poorly operated complicated plant.

TABLE 1—COST OF TOPPING AND TREATING

	Large plants (10,000 B.p.d.)	Small plants (1,000 B.p.d.)
Fuel	0.9- 6.0	1.1- 7.0
Water	0.6	0.1- 0.7
Steam and power	0.2- 2.5	0.2- 3.7
Labor	0.3- 0.6	1.5- 3.4
Depreciation	0.4- 0.8	0.5- 2.6
Maintenance	0.3- 1.6	0.5- 1.8
Total topping cost	2.1-12.1	3.9-19.2
Treating (sweetening) cost	0.2- 1.0	0.3- 1.2

The same information is shown on a percentage basis in Table 2.

TABLE 2—DISTRIBUTION OF TOPPING COSTS, PER CENT

	Large plants	Small plants
Fuel	42-49	28-36
Water	2- 5	3- 4
Steam and power	9-21	5-19
Labor	5-14	18-38
Depreciation	7-19	13-14
Maintenance	13-14	9-13

Fuel costs vary not only because of the direct cost of gas or fuel oil but by the percentage of the crude oil that is topped (40-70 per cent), the amount of heat exchange (220°-450°F. outlet temperature), and efficiency of the pipe still (55-75 per cent). The low cost of 0.9 cent per barrel arises in a large plant in which the heat exchange and pipe still are efficient, fuel is cheap, and only a small percentage of the crude oil is vaporized. Heat exchange is contemplated in all plants, and without any exchange the cost of fuel would be almost doubled.

The cost of fuel is such an important item that the following tabulation of fuel costs versus exchanger-outlet temperature is presented:

Exch.-outlet temp.	Fuel cost, cts./bbl. Min.	Max.
60 (none)	1.16	7.25
100	1.08	6.80
200	.83	6.00
300	.42	5.10
400	.34	4.22

Minimum values are for low fuel costs (14 cents per million), low pipe-still outlet temperatures (450° F.), small amounts vaporized (40 per cent), and a high pipe-still efficiency, whereas the maximum values are for high fuel costs (30 cents per million), a high pipe-still temperature (700° F.), a large amount vaporized (70 per cent), and a low pipe-still efficiency (50-55 per cent based on net heating value).

Water costs are also dependent on the amount of heating but the cost of water (0.3-2 cents per 1,000 gal.) and the temperature rise that can be permitted (30°-50° F.) are important. The extreme cost of 0.7 cent per barrel is due to a high water cost, a somewhat warm water which is so hard that it cannot be heated to more than 120° F. without scaling, and a topping (and reducing) operation that distills 70 per cent of the crude oil.

Steam cost or **consumption** is of two kinds, for processing and for power. Generation costs range from 15 to 31 cents per 1,000 lb., and the amount required ranges from 12 to 122 lb. per barrel. The extreme value involves the use of steam-driven pumps, a high steam cost, 54 lb. of steam per barrel for vaporizing 70 per cent at 700° F., and a 40 per cent plain loss of steam by leaks and uninsulated lines.

Labor and **direct supervision** costs vary mainly by the size of the plant but also somewhat by labor rates (60 cents-$1.00 per hour.) Large plants need scarcely more operators than small ones but they may support a topping-plant foreman.

Depreciation costs are directly dependent on the cost of plant and the time for depreciation (8-15 years). Obviously a large plant costs much less than a small one on a per barrel basis ($16-$65 per daily barrel).

Overhead is not included in any of the cost tabulations. This may involve time of the superintendent, laboratory staff, research, sales, and executive managements. In large refineries this item becomes large and in small plants it may range from very little to a very large figure which represents nearly all of the overhead costs of the organization. Thus the costs given in Table 1 might be raised in cost to—

Large plants	4-17 cents per barrel
Small plants	5-24 cents per barrel

Complexity of processing can range from a simple system which receives heat almost totally from a cracking or other high temperature process to a complicated topping or reducing process that involves two pipe stills (or coils) and the production of many different topping-plant products. The costs given here do not contemplate the manufacture of aviation gasoline or numerous special solvents.

TABLE 3—TOPPING-PLANT FACTORS AND COSTS

	Per bbl. or daily bbl.	Capacity, B.p.d.
Construction cost	$16-65	1,000-10,000
Operating cost	2-12 cents	10,000
Operating cost	4-19 cents	1,000
Heat for oil only	65,000-240,000 B.t.u.	1,000-10,000
Water	2.4-8.5 bbl.	1,000-10,000
Steam, total	12-122 lb.	1,000-10,000
Steam, stripping only	1.5-18 lb.	.....
Doctor sweetening	0.8-3 cents	.....
Copper sweetening	0.7-1 cent	.....

No. 27 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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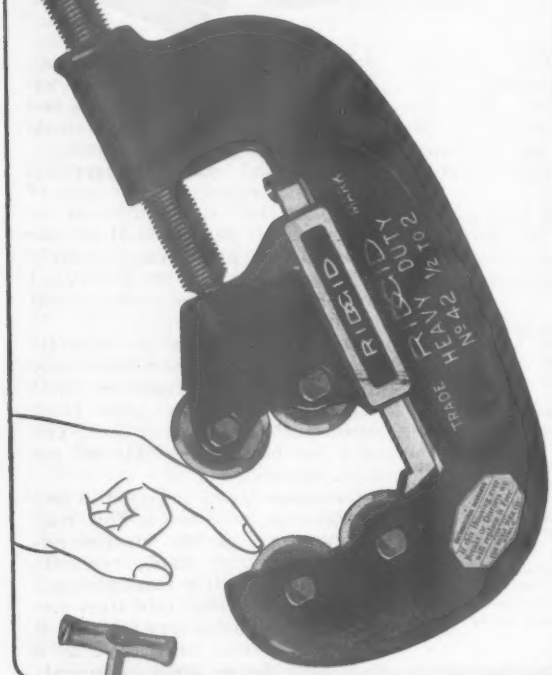

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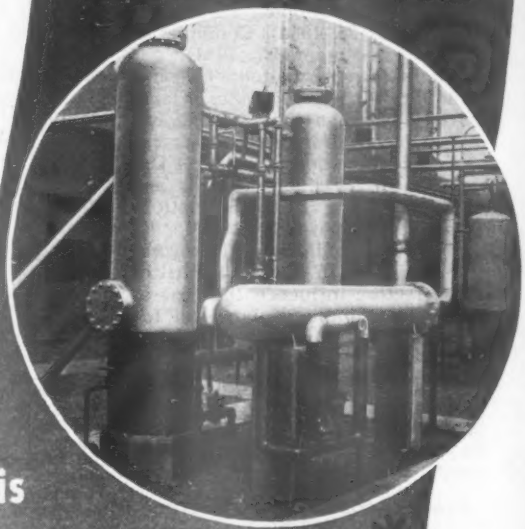

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Underground Water in Oil Fields

WATER reaches the ground from clouds in the form of rain or snow. Some of the water evaporates and returns to the clouds. Another portion flows over the earth's surface in the form of streams and rivers. The rest sinks into the ground and becomes ground water. Ground water may be conveniently classified into three kinds, as follows: (1) Fresh or meteoric water, which may have a concentration of salt (sodium chloride) ranging from 0 to 300 p.p.m. and is suitable for drinking; (2) brackish water, a mixture of fresh water from the soil, saline water originally in the sand, and water which has dissolved soluble minerals out of the subsurface formations. Brackish water has a concentration of sodium chloride ranging from 300 to 1,900 p.p.m. and is unsuitable for drinking; (3) salt water, sometimes called connate or original water. Connate water may have a concentration of sodium chloride of 1,900 p.p.m. or more. This is the original sea water which was trapped in the sand when the sand was deposited in the sea together with other salts which have been derived from subsurface rocks.

Oil sands are generally broad, continuous sheets of sand like the Woodbine sand of East Texas and the Bartlesville sand of Oklahoma. The Woodbine sand, for example, contains fresh water down for a distance of 15 to 30 miles from its outcrop, then brackish water from 30 to 50 or 60 miles, and, finally, very salty water increasing in salinity and per cent of total solids from 50 or 60 miles down to the lower portion of the Woodbine sand sheet. In most oil fields there are several horizons at different depths below the surface where water occurs. In such places, generally the deepest water has traveled farthest and is most saline and contains the largest number of total solids. The shallowest water which is nearest its outcrop is least saline. Oil-field workers and drillers commonly designate water which occurs in a separate sand above oil, "top water"; water which occurs in an oil sand, "edge water"; and water which occurs below the oil, "bottom water." In many places where water occurs in an oil well with the oil, it is difficult to be sure whether it originated below, above, or in the oil sand. Therefore, some means of identifying unknown waters as a means of determining their position in an oil-field section is important. Unknown waters may be identified by chemical anaylses, by temperature measurements, by pH determinations, and sometimes by measuring the hydrostatic head of the water. The first method is most commonly used.

Chemistry of ground water.—Most oil-field water contains the following chemicals in varying proportions: sodium chloride, calcium bicarbonate, magnesium carbonate, potassium chloride, sodium carbonate, and traces of iron, sulfur, iodides, strontium, and copper. The character of water in the subsurface depends upon the lithology of the porous layer; i.e., whether it is a sandstone, limestone, or igneous rock, and it also depends upon the soluble minerals or other soluble substances with which the water comes in contact as well as the rate of movement of the water. Since the minerals and soluble substances are different in different layers, it is obvious that no two waters should be exactly the same. In some fields, for example, distinct types of water mark various definite horizons in an oil well. In regions of Tertiary and Cretaceous rocks, shallow water contains a fairly large percentage of calcium, magnesium, sulfates, and some carbonates, but is deficient in chlorine and generally low in sodium and potassium. The waters from intermediate depths contain considerable sodium, potassium, calcium, magnesium, and sulfates and only small amounts of chlorides and bicarbonates. The deep waters contain only small amounts of sulfates and carbonates and only small amounts of calcium and magnesium, but large percentages of sodium chlorides, and total solids (Fig. 1). In general, shallow waters are rich in sulfates, but these compounds gradually disappear with depth, and the chlorides increase. Waters associated with oil and in contact with carbonaceous shales usually contain hydrogen sulfide, iodides, traces of strontium, and sometimes nickel. Other waters coming from upper sands in many places are free of these substances. Typical examples of the composition of water from different depths are shown in Table 1.

TABLE 1—CHEMICAL COMPOSITION OF UNDERGROUND WATER IN TEXAS WELLS (PARTS PER MILLION)

County and formation—	Depth (ft.)	Calcium	Magnesium	Sodium and potassium	Bicarbonate	Sulfate	Chloride	Total solids
*Gillespie, Hickory ..	56	8	29	0	195	....	56	213
*Mason, Hickory	150	73	28	0	342	....	13	290
*Mason, Hickory	310	69	38	2	384	....	8	312
*Mason, Hickory	580	68	26	42	305	88	16	391
*McCulloch, Hickory	2,014	53	37	50	376	47	24	406
†Denton, Woodbine..	170	8	14	162	382	76	29	477
†Dallas, Woodbine ..	600	5	59	271	600	373	129	1,544
†Dallas, Woodbine ..	1,457	4	1	785	898	341	454	2,027
*Kaufman, Woodbine	2,140	14	56	1,280	1,218	275	1,250	3,475
*Limestone, Woodbine	3,039	542	169	11,384	324	24	18,800	31,135
*Gillespie, Trinity...	87	6	59	76	220	10	60	321
*Gillespie, Trinity...	94	58	48	21	427	0	30	370
*Gillespie, Trinity...	200	2	36	50	232	0	52	256
*Coryelle, Trinity ...	760	8.4	5.1	434	400	213	270	1,172
*Bell, Trinity	948	14	7.1	779	484	347	....	2,100
‡Young, Gose	556	20	6	222	526	34	64	....
‡Young, Gose	772	635	211	8,040	50	9	14,100	....
‡Young, Gose	850	1,360	418	12,100	36	0	22,230	....
‡Archer, Gose	1,118	7,228	1,727	36,000	34	23	73,300	....
‡Archer, Gose	1,377	7,010	2,025	39,700	53	0	79,500	....
‡Archer, Gose	1,713	8,468	2,192	42,800	44	12	87,300	....
‡Wichita, Gose	1,927	14,750	2,045	64,400	35	303	132,200	....

*Analyses from data obtained from the Texas State Board of Water Engineers, working in cooperation with the U. S. Geological Survey. †Analyses by E. C. Sargent. ‡Analyses by Virgil E. Barnes.

Series prepared by F. B. Plummer, professor, petroleum engineering school, University of Texas

Engineering Fundamentals (Continued)

A FEATURE OF THE OIL AND GAS JOURNAL

These very brief tables and graph (Fig. 1) indicate how the chemical composition of water varies with depth and from one formation to another. It is noteworthy, particularly, that the rate of change of concentration of chlorides and total solids with depth is much more rapid and that the total amounts are greater in oil sands in the Pennsylvanian and older oil sands, for example the Gose sand of North Texas, than in the geologically younger sands of the Gulf Coast region. Yet if one knows the chemistry of the underground waters of a particular region, he will be able to determine from analyses the approximate depth and horizon from which the water came as indicated by the graph (Fig. 1).

Methods of calculating reacting values.—Many engineers have found it more convenient to compare the composition of different waters if the analyses are expressed in terms of the reacting values of the radicals and elements in the water rather than by parts per million. Most analyses of oilfield waters are now reported both in parts per million and in percentage of reacting values. Reacting values are determined as follows: Reacting values = milligrams per liter of each element and radical obtained by the analysis multiplied by its reaction coefficient. The reaction coefficient is the reciprocal of the equivalent combining weight of the element or radical. The equivalent combining weight is determined by dividing the atomic weight of the element or radical by its valence. Thus the reacting coefficient of the calcium is found as follows:

	Atomic weight	Valence
Calcium	40.09	2

Equivalent weight $= \frac{40.09}{2} = 20.04$

Reaction coefficient $= \frac{1}{20.04} = 0.0499$

The reaction coefficients of the substances commonly found in water are given in the following table:

REACTION COEFFICIENTS

Elements	Reaction coefficients	Negative radical	Reaction coefficients
Calcium	0.0499	Hydroxide	0.0588
Magnesium	0.0822	Carbonate	0.0333
Sodium	0.0435	Bicarbonate	0.0164
Potassium	0.0256	Sulfate	0.0208
Hydrogen	0.992	Chloride	0.0282

Suppose, for example, an analysis of a California water by a chemist shows the following analysis:

CHEMICAL COMPOSITION OF UNDERGROUND WATER IN CALIFORNIA

	Mg. per liter
Sodium	435.2
Calcium	73.1
Sulfate	45.9
Chloride	421.1
Bicarbonate	594.5

Then, by multiplying the reacting coefficients by the above weights, the following reacting values are obtained:

	Reacting coefficient	Weight, mg. per liter	Reacting value	
Sodium	0.0435	× 435.2 =	18.93	= 22.57
Calcium	0.0499	× 73.1 =	3.64	
Sulfate	0.0208	× 45.9 =	0.95	
Chloride	0.0282	× 421.1 =	11.87	= 22.87
Bicarbonate	0.0164	× 594.5 =	9.75	

The sum of the positive radicals should equal the sum of the negative radicals in any ground water. This rule furnishes a check on the accuracy of the computations and makes it possible in case the work is accurate, to determine the reacting value of one of the elements without taking the time for analysis, provided the reacting values of all the others are accurately known. Suppose you have determined by analysis the milligrams per liter of the calcium, chloride, sulfate, and bicarbonate radicals, all of which are simple determinations, and you wish to know the amount of sodium present in the water, a determination which is more difficult, you would add the reacting values of the negative radicals together and obtain 22.57. Subtract from 22.57 the reacting value of your positive radical, namely 3.64, and you obtain 18.93, the reacting value of sodium. Now divide 18.93 by the reacting coefficient of sodium, 0.0435, and you obtain 435.2 milligrams per liter of sodium in water.

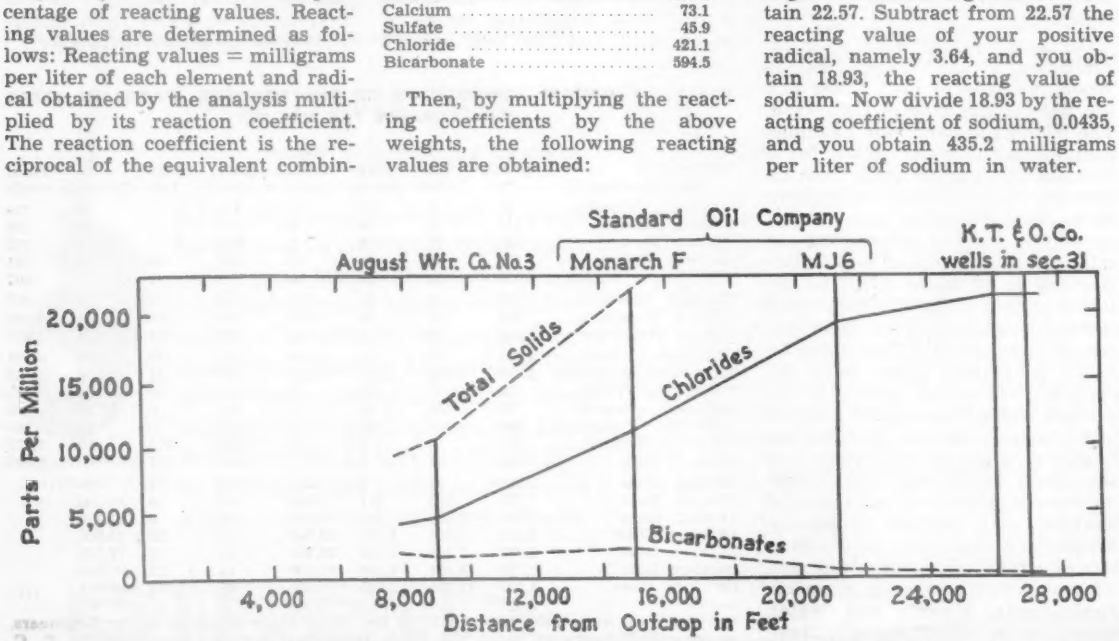

Fig. 1: Diagram showing increase in chloride and decrease in carbonate in waters with distance from the outcrop, Sunset-Midway field, California (after Rogers)

Natural Gas

Proceedings Combined in Consolidated Gas Case

WASHINGTON. — Federal Power Commission has consolidated proceedings arising from applications filed by Consolidated Gas Utilities Corp. for permission to construct and operate additional facilities in Kansas and Texas. Hearing is set for February 12. Substantially the same issues are believed to be involved in the two cases.

Deadlock Over Gas Line Causes Postponement

PHILADELPHIA.—After listening to 3 hours of argument on whether intervenors could cross-examine H. D. Munsell, Chicago, vice president of United Light & Power Co., concerning plans for a new natural-gas pipe line to be laid at an estimated cost of $70,000,000, Securities and Exchange Commission announced it would issue a statement giving its tentative views regarding procedure. The commission's statement is expected within a few days. Meantime, all hearings are postponed.

The deadlock among counsel for the company and intervenors arose after Donald R. Richberg, counsel for United, said no court could compel testimony on plans for the pipe line since they are not a part of the present proceedings.

Richberg said the hearing was concerned with the first step in a plan of liquidation for a United subsidiary, American Light & Traction Co., and that it should be confined to the mechanism to retiring outstanding preferred stock at its $25 par value.

Complete plans for the pipe line, to be laid from the Hugoton field in Texas, Oklahoma and Kansas, to Detroit, Milwaukee and Madison, Wis., and towns in Illinois and Iowa, will be filed with Federal Power Commission within 90 days, Richberg said.

Panhandle Eastern Pipe Line Co., one of the intervenors, could use the hearing "to smoke out confidential information," Richberg contended. Panhandle supplies natural gas to Detroit.

Richberg termed the new pipe line "absolutely necessary to continue furnishing the needed supply to one of the country's largest cities" and said Panhandle was "unwilling to continue furnishing the present and expanded needs of Detroit."

Arthur G. Logan, counsel for Panhandle, said his company would negotiate for a change in its contract to supply Detroit with gas at any time.

"They have ample gas and we never said we were unwilling to furnish them additional gas to meet requirements," Logan said. "Apparently somebody is planning to build a $70,000,000 pipe line, starting at the field where we start and going where we go," he added.

Joseph L. Weiner, New York, counsel for Allied Chemical & Dye Corp., holder of more than a 10 per cent interest in American Light & Traction, said "the form of this application and the way it has been presented here seem to us reckless and irresponsible."

Commission's Right to Get Evidence Upheld by Court

AUSTIN. — An opinion handed down last week by Third Court of Civil Appeals holds that the Texas Railroad Commission has a legal right to use its employes in gathering evidence and presenting it in gas utility rate cases before the commission.

The appeals court affirmed an Austin District Court decision in a declaratory judgment proceeding practice. The suit was brought by Houston Natural Gas Corp., which is engaged in a dispute with the city of Palacios over an ordinance reducing the Palacios gas rates. The rate matter was referred to the commission for adjudication.

The company then asked the District Court to declare whether the commission, in such instances, could use its own employes as witnesses and attorneys in the case.

Ask Exemption From Order On Pressure Maintenance

AUSTIN.—Three gas sands in the Agua Dulce area near Corpus Christi should be exempted from pressure-maintenance orders issued by Texas Railroad Commission, it was testified by engineers representing Union Producing Co. at a hearing before the commission last week.

W. F. Fulton, a chemical engineer, said a requirement for cycling natural gas to return dry gas to the reservoir after removing its liquid elements does not necessarily aid conservation. The Comstock A and B sands, said Fulton, could not be recycled profitably according to tests which the engineer had made.

E. H. Rawlins said that a third sand, the Bentonville, already has been recycled as far as possible.

Union Producing has requested the commission to exempt the two Comstock sands and the Bentonville from its pressure-maintenance orders.

Central Illinois Seeks Gas Supply for Four Towns

WASHINGTON.—Central Illinois Public Service Co. has petitioned Federal Power Commission to direct Panhandle Eastern Pipe Line Co. to extend its pipe-line facilities, establish a connection with the petitioner's distribution system at Mattoon and to sell the petitioner gas to meet its requirements in Mattoon, Charleston, Paris, Effingham and intermediate communities in eastern Illinois. Hearing is set for March 2.

Central Illinois now obtains its supply of gas from Kentucky Natural Gas Corp. at a point on the Illinois-Indiana state line west of Terre Haute, Ind., and the Kentucky company, in turn, is served by Panhandle. The petition says Central Illinois' facilities are inadequate, but would be sufficient if gas were supplied at Mattoon, about 20 miles from Panhandle's line.

Southern Gas Association Cancels Annual Meeting

SHREVEPORT. — Southern Gas Association, in deference to the request of War Mobilization Director Byrnes, has canceled its annual meeting, scheduled for March 6-7, in Galveston, F. S. Kelly, Jr., president, announces.

Natural Gasoline

Gulf Refining Employes Reject C.I.O. 10 to 0

WASHINGTON.—Employes at the Overton, Tex., gasoline plant of Gulf Refining Co. voted 10 to 0 against having the C.I.O. represent them as collective bargaining agent, National Labor Relations Board announced. The election was held December 27.

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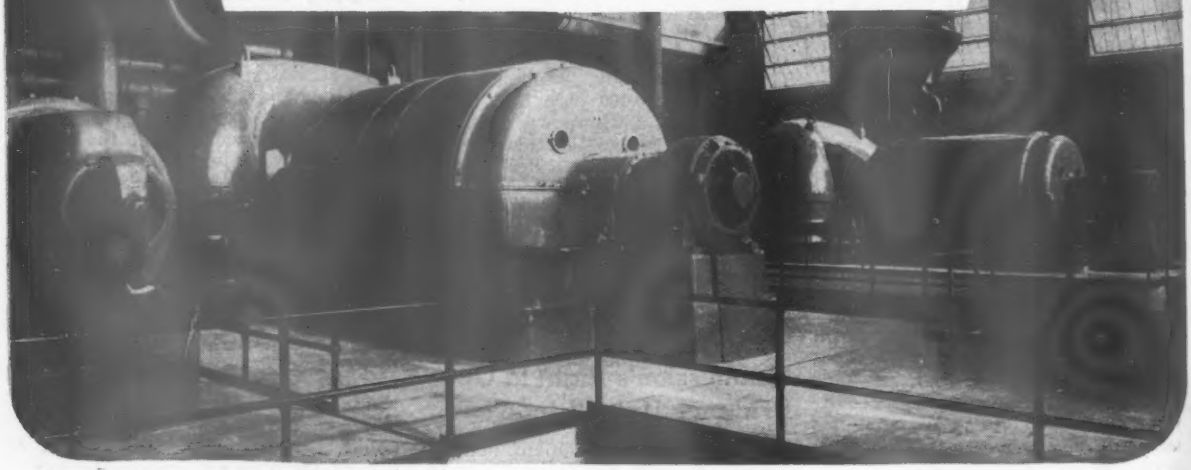

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REFINING

Demurrage Order to Be Revised If Ineffective

WASHINGTON. — Following the recent meeting of the tank-car advisory committee of Office of Defense Transportation to consider protests against the Interstate Commerce Commission's order imposing heavy demurrage charges on tank cars standing on sidings, Col. J. Monroe Johnson, ODT director, has sent to those who attended the meeting a letter designed to clarify the situation. As a result of the committee's conference the order fixing the demurrage charges was modified so that it applied only to loaded tank cars held for unloading.

"This is an experiment," Colonel Johnson says, "and unless great improvement is had at the loading end and at once, the order will be amended to include the loading end."

Johnson contends that demurrage would expedite the handling of cars, under the same conditions at the same place, no matter what may be said to the contrary. Amendment of ODT General Order 7, suggested in lieu of demurrage at the loading end is criticized by Colonel Johnson because it involves receipt of 3,600 telegrams a day from railroads and shippers.

Under its provisions, railroads would compile the number of serviceable empty tank cars on hand as of 7 a.m. each day except Sunday for each point on their lines which originates shipments of liquids transported in tank cars.

Railroad agents at such points would notify each shipper by 11 a.m. daily of such liquids and the number of serviceable empty tank cars available for placement.

Shippers, in turn, would notify the ODT tank-car division each day of the number of tank cars shipped under load in the last 24 hours, the number of unbilled loaded tank cars on the shipper's owned or leased tracks, the number of empty tank cars held on the shipper's owned or leased tracks (excluding bad-order cars), the number of empty tank cars shipped empty elsewhere in the last 24 hours, and the number of bad-order tank cars on hand carded for shops.

"The situation involved in the transportation of petroleum, chemicals, vegetable oils and other important commodities transported in tank cars is so critical that every possible action must be taken which will result in the movement of a substantially larger volume," says Johnson. "We have not failed yet to meet the over-all transportation requirements in this field and will not fail if you will do your part, which may include much greater sacrifices than any you have made heretofore."

Kendall Acquires Holdings Of Olean Petroleum

BRADFORD, Pa.—Kendall Refining Co. has purchased the oil holdings of Olean Petroleum Corp., 6 miles east of Kane. The consideration was not made public.

There are nearly 1,050 oil wells on the 5,000-acre property in Westmore and Sergeant townships, producing about 300 bbl. daily. The Olean company bought the property

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from Tidewater in 1928 when it contained 299 wells, and has installed power and pressure plants. The lease is electrically operated.

Oil from the tract goes into the Bradford Transit lines for refineries south of Kane.

Tide Water's Big Cracking Plant Starts Operation

SAN FRANCISCO. — Tide Water Associated Oil Co. has started operation of its new cracking plant at the Avon refinery, described by L. F. Bayer, vice president in charge of manufacturing, as the world's largest fluid catalytic cracking unit. This massive unit, for production of materials used in the manufacture of 100-octane aviation fuel, has a charging capacity of over 750,000 gal. of gas oil daily. Main construction work on the plant, with its 200-ft. tower, was performed by C. F. Braun & Co., who also designed the unit, with the cooperation of engineers of Universal Oil Products Co., licensor of the process.

Motor Transport Organized For Pennsylvania Products

OIL CITY, Pa. — Organization of Pennland Tankers, Inc., with principal offices in Rouseville, near here, has been approved by Pennsylvania Utility Commission, with authorization to operate as a common carrier of petroleum products in bulk. Business of the new corporation will be chiefly in western Pennsylvania.

The new company is headed by R. H. Anderson, who for years has been president of Clare M. Marshall, Inc. It will serve all of the major refiners and marketers in the Pennsylvania field, and officials report that approximately 70 pieces of equipment will be operated, with terminals at Bradford, Rouseville, Indiana and Rochester, Pa.

Approximately 75 employes will be utilized. Many of them are former employes of Clare M. Marshall, which has relinquished its rights as a contract carrier in Pennsylvania but will continue operation in interstate commerce.

Work on Synthetic-Fuels Program Is Started

WASHINGTON. — Contract has been awarded to a Pittsburgh construction company for building an access road and grading the site for the laboratory to be erected at Bruceton, Pa., by the U.S. Bureau of Mines for research and development work in production of synthetic liquid fuels. The laboratory, one of the first steps in a 5-year program authorized by Congress, will be used in eliminating "kinks" in various processes whose commercial value is to be determined in demonstration pilot plants to be built by the bureau later.

Among objectives of the laboratory, Petroleum Administrator Harold L. Ickes said, will be improvement of processes for hydrogenation and gas synthesis employed in England, Germany, and other foreign countries, so that the demonstration plants can incorporate up-to-date techniques.

Ultimate goal of the entire program is to develop patterns for production of fuels and lubricants from America's huge reserves of coal and shale.

Construction of the laboratories is scheduled to begin about February 12. The site for the second building must be ready by February 20, and the entire job, which involves moving 100,000 cu. yd. of material and constructing a 600-ft. access road, must be completed by April 25.

The laboratory at Bruceton, near Pittsburgh, will be built on a tract of government-owned land, part of which now is being used for research activities in other fields. The laboratory and related facilities, occupying about 7 acres, will include three large buildings, a powerhouse and several smaller service buildings. Equipment will be installed as rapidly as construction permits.

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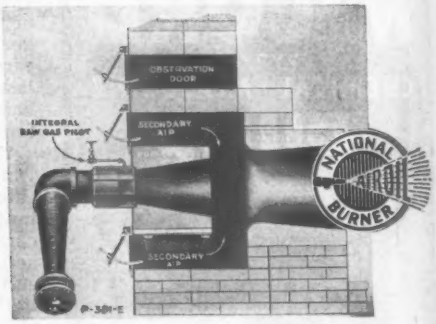

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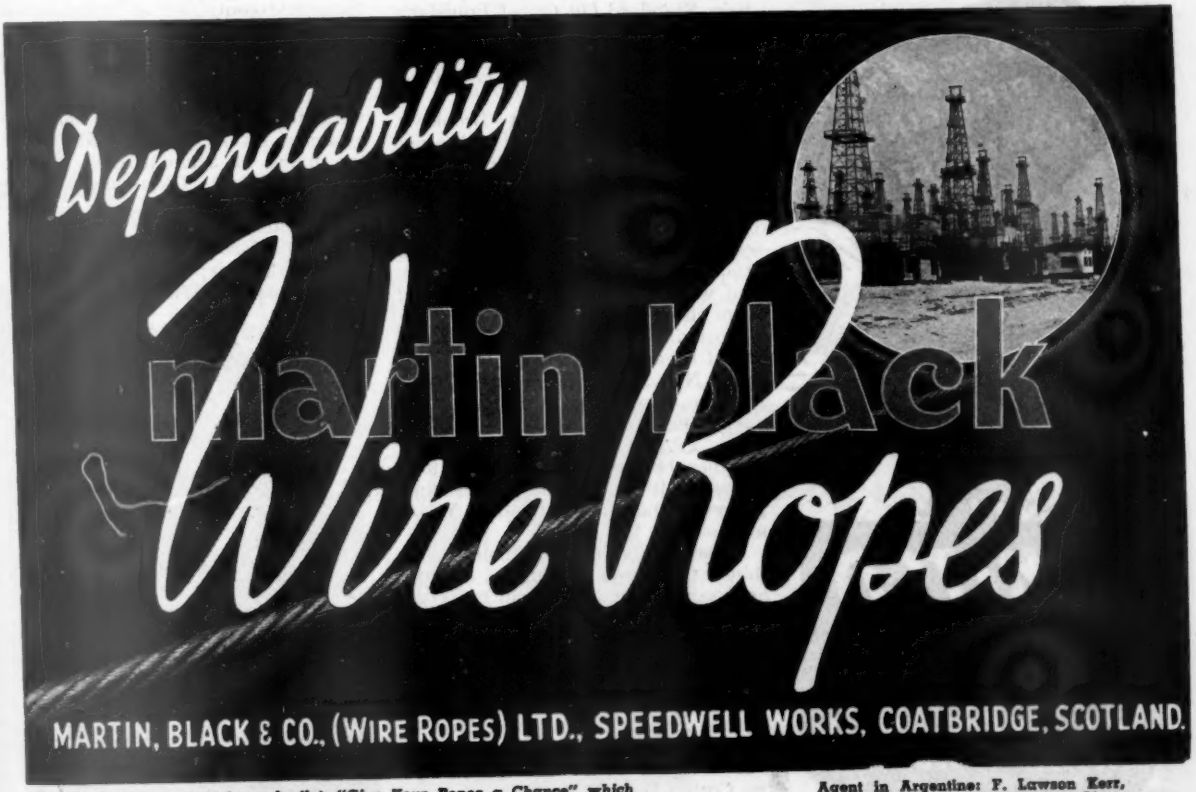

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PIPE LINES

Ohio's Products Terminal To Be Ready in March

Construction work at the Indianapolis terminal of Ohio Oil Co.'s refined products line is expected to be completed in March. The company's Robinson, Ill.-Indianapolis 105-mile 8-in. line has been satisfactorily tested with air.

Union Gas 70-Mile Line in Ontario

For transmitting natural gas from connections at Detroit, Mich., to underground storage at the Dawn field in Ontario, Union Gas Co. of Canada is making plans to build a 70-mile pipe line as part of a project which is estimated to cost $3,000,000.

WEP Products Line Breaks Records

The War Emergency Pipelines, Inc., 20-in. products line established a new record by pumping a daily average of 230,120 bbl. daily for the December 30-January 5 period for shipments from Beaumont, Tex., to Linden, N. J. In the same period the WEP 20-in. crude-oil line maintained its high throughput averaging 315,976 bbl. daily from Longview, Tex., to Norris City, Ill. There

PIPE-LINE PERSONALITIES

W B. FULTON, chief engineer, Interstate Oil Pipe Line Co., recently came to his present position from Standard Oil Co. of Louisiana. In his engineering career in the past 35 years he has been engaged in electric power, railroad and pipeline activities.

Fulton was born at Brooklyn, N. Y., where his first job at the age of 13 was delivering surgical instruments for $3 per week. While in high school at Wahoo, Neb., he concentrated on mathematics and physics to prepare for engineering studies, played on the baseball team, and worked for his living by doing farm chores.

To maintain himself while studying at Fremont Normal College, Fremont, Neb., it was necessary to drop out for a semester occasionally to earn enough money for another term, usually by farm work. One summer before graduating in 1910, he was with a railroad engineering party in the Casper-Lander, Wyo., area.

After graduation from college, he joined California Edison Co. in 1910 and worked for 3 years in the construction of dams, power houses, transmission lines, highways, railroads and tunnels through mountains. For a year he was a hotel engineer at New Orleans before he became a valuation engineer for the Texas & Pacific Railroad. Later he was assistant division engineer for the Cotton Belt Railroad.

In 1918 Fulton started with Standard Oil Co. of Louisiana as a draftsman. Two years later he became chief engineer of pipe-line operations and continued in this position until he was transferred to his present position this month with the Interstate company with headquarters in Tulsa where he is concerned with the engineering problems of systems formerly operated under the name of Standard Oil Co. of Louisiana and Oklahoma Pipe Line Co.

He married during his railroad career. There are two children: Ethel of Shreveport and W. B. Jr., an ensign in the Navy.

were no deliveries at that time to the Ohio line; deliveries to the East Coast from Norris City were 311,412 bbl. daily.

Pipe Line and Storage System for Britain

Further information regarding the 1,000-mile pipe line and storage system built in Britain indicates that £7,000,000 has been spent in 3 years on a system which has utilized 80,000 tons of steel for the lines and the extensive secret underground storage for serving Allied war operations.

Reduced Barge Building Program Nears Completion

Rapid progress is being made in completing what is considered the last leg of the wartime oil barge construction program.

The present phase consists of 25 steel barges, recently started as a substitute program for a project of 100 that had been recommended first. Of the 25 authorized, five have been completed, 13 more will be completed by January 31, according to present indications, and the remaining seven should be completed by Feb. 28.

Phillips Lets Contracts For Two Pipe Line Jobs

Phillips Petroleum Co. let three contracts for new pipe-line construction. Harry Liles, Oklahoma City, will lay 70 miles of 2-in. to 20-in. for a wet gas gathering system in the West Edmond field, Oklahoma. For 24-in. gas lines to serve carbon-black plants in the Texas Panhandle, United Contracting Co., Wichita Falls, Tex., will lay 8 miles in the Borger area and R. H. Fulton & Co. will build 22 miles in the Sneed area. Construction of these lines totaling 100 miles is scheduled to start soon

Interstate to Construct 121-Mile Crude-Oil Line

Interstate Oil Pipe Line Co. is preparing specifications for construction of a 12-mile system for moving crude oil from Mississippi fields to Standard Oil Co. of Louisiana's refinery at Baton Rouge. The line will consist of a 12-in. trunk with laterals of 8-in. and 10-in.

It is expected that work on the project will start in March with the object of completing so as to put the system in operation in June or July. Crude oil from Mississippi is now moving to Baton Rouge by tank cars and river barges.

More Tankers Needed To Serve East Coast

Assignment of additional oil tankers to East Coast service is needed to stave off a threatened critical shortage of oil for civilian heating, according to a statement of Petroleum Industry War Council.

Pipe Line Used for Moving Wine in France

A pipe line for moving wine has been established across the Loire River in France to expedite shipments to Paris, according to the New York Times which says that French wine producers took a hint from the portable pipe line methods of the United States Army when transportation was impeded by the destruction of nearly all of the bridges across the Loire. While repairs are being made only a few of the bridges are available for traffic.

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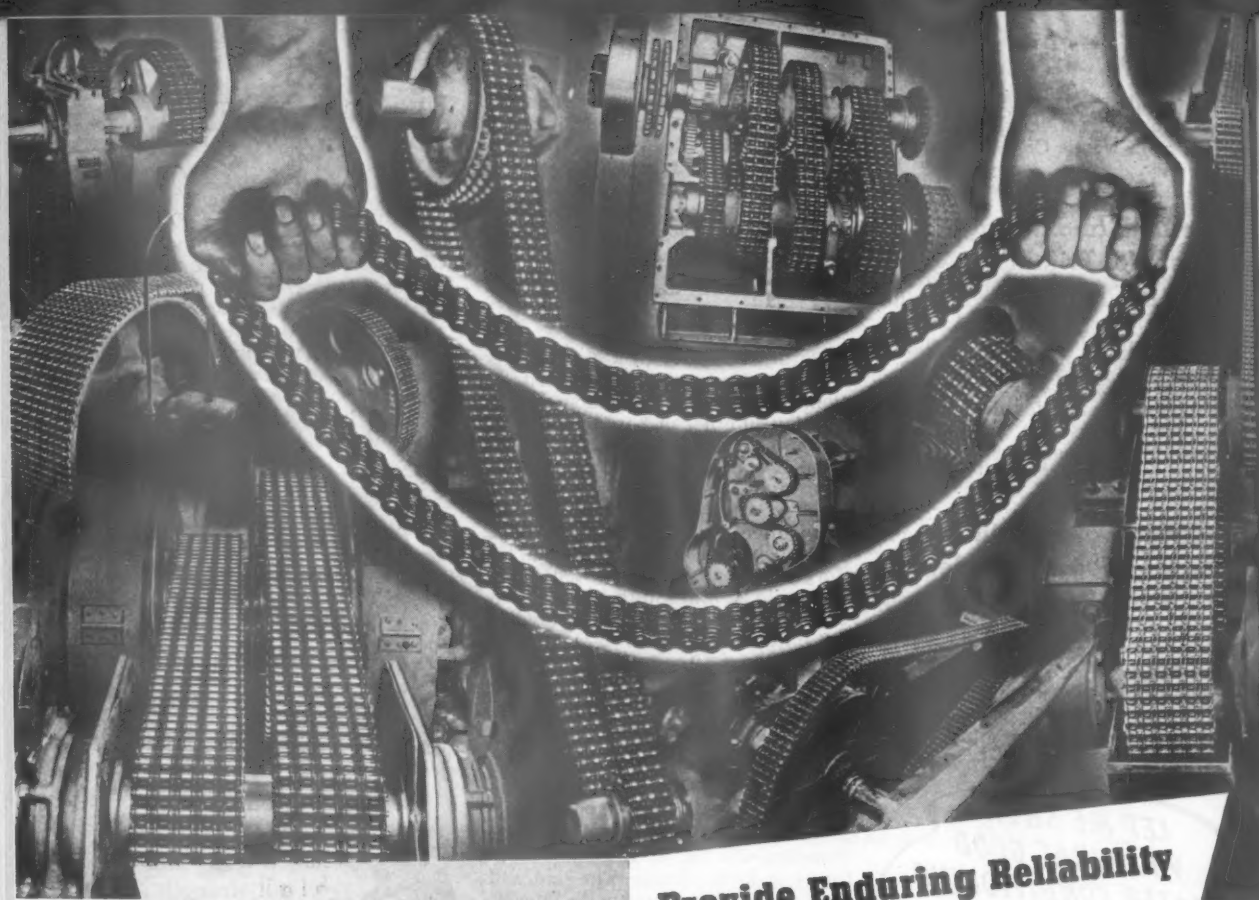
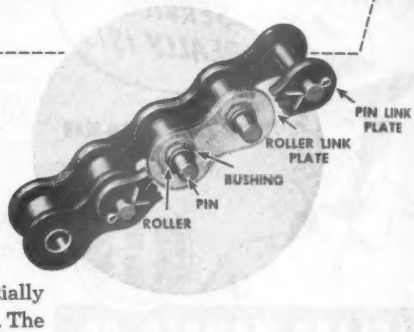


Drives Like These Provide Enduring Reliability



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Exploration and Drilling

Week's Highlights

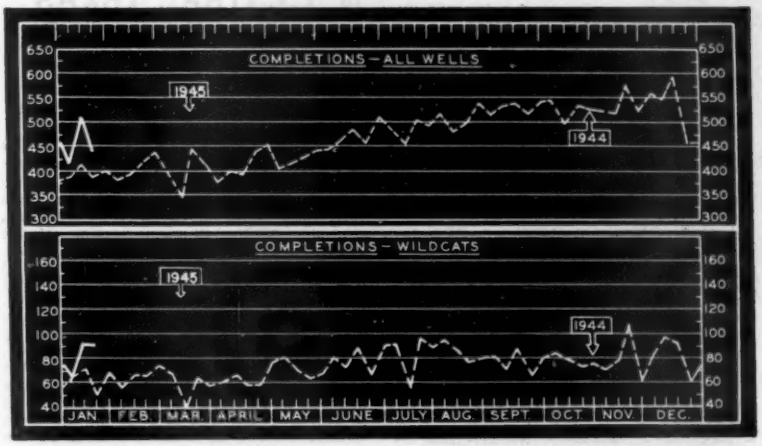
THE probable 5-mile south extension of the West Edmond field in Oklahoma by the Phillips Petroleum Co. and Kerlyn Oil Co. 1 Classen, NW SE 22-12n-4w, making the field zone 20 miles long, is intensifying a discussion that has been going on among the geologists.

The broadest question being discussed is the nature of porosity in limestone reservoirs in general. At present, most geologists recognize dolomitization porosity as a separate class and divide the other class of solution porosity, cracks and crevices into two types. Type one is due to weathering from surface exposure. Type two is due to the recrystallization of dissolved lime after the introduction of secondary minerals in circulating waters, and the attendant fracturing, owing to uneven deposition of recrystallized material. In both types the porosity tends to be irregular and spotted when any substantial area is considered.

A 20-mile-long zone of relatively uniform porosity, nondolomitic in nature, such as is found in West Edmond simply does not fit in the pattern of the two general types now recognized. So these geologists argue that there is a clue to a set of conditions that creates a third type and that West Edmond is a case that calls for reexamination of the causes of limestone porosity.

The second general question relates to the possibilities of finding more Bois de'Arc-Hunton fields in the Anadarko basin, and the kind of oil that will be found. The key factor in this theory is the quality of the oil found at West Edmond, and also in certain other Hunton and Wilcox fields in parts of Oklahoma. Briefly the idea is that the oil is actually Pennsylvanian in source, even though found in pre-Pennsylvanian formations.

The basic idea is that there must be a critical thinness of the entire Mississippian section; an "X" factor of uniform excess porosity, which has been discussed above, and trapped water in that porosity. Under these conditions, at some point, the reservoir bed is exposed to Pennsylvanian source beds, from which the oil migrates and accumulates in the porous zone.



Solid line charts current weekly completions, service wells in Eastern area included

COMPLETIONS IN ALL FIELDS . . .

Week ended January 20, 1945

	Oil	Gas	Dry	Total	Footage	Total Comp. to date 1945	1944
N. Y., Penna., W. Va.	40	21	*38	99	149,010	284	170
Ohio	5	6	4	15	42,987	37	48
Indiana	0	0	1	1	2,738	7	14
Kentucky	2	0	1	3	4,838	17	41
Illinois	24	0	11	35	92,329	122	92
Michigan	3	1	7	11	29,476	43	28
Kansas	10	2	20	32	111,389	73	91
Nebraska, Missouri, Iowa	0	0	0	0	0	6	7
Oklahoma	21	2	5	28	133,948	134	64
Texas:							
North Central	19	2	14	35	83,210	108	55
West	31	0	6	37	193,100	87	87
Panhandle	3	4	0	7	20,453	18	6
Eastern	2	1	2	5	30,846	18	25
Gulf Coast	15	4	10	29	191,830	105	22
Southwest	4	2	5	11	40,430	37	56
Total Texas	74	13	37	124	559,869	373	251
Louisiana:							
Northern	1	1	6	8	40,870	15	17
Southern	10	0	4	14	133,831	33	20
Total Louisiana	11	1	10	22	174,701	48	37
Arkansas	3	0	4	7	29,027	12	9
Mississippi	4	0	3	7	44,580	16	11
Southeastern States	0	0	0	0	0	1	†
Montana	4	1	0	5	11,561	13	13
Wyoming	4	0	2	6	29,429	15	7
Colorado-Utah	0	0	2	2	6,100	4	1
New Mexico	8	0	5	13	51,821	30	22
California	26	0	4	30	135,215	132	96
Total United States	239	47	154	440	1,609,018	1,367	1,002
Total previous week	279	36	196	511			
Total Jan. 22, 1944	187	36	101	324			

*Includes 33 service wells. †Included in total shown for Mississippi.

OKLAHOMA

W. Edmond South Extension Produces Gas

THE Phillips Petroleum Co.-Kerlyn Oil Co. 1 Classen, NW SE 22-12n-4w, is apparently a 5-mile south extension for the West Edmond field, but whether it is a gas well or an oil well is still a question. After perforating casing at 7,154-7,200 ft., opposite the Bois d'Arc section of the Hunton lime, with 184 shots, and running tubing, the well started flowing about 5 bbl. per hour, half water, half oil. After several days of this, the well was acidized with 1,000 gal. It cleaned out and began to flow colorless gas at a rate estimated at 12,000,000 cu. ft. per day. Because of atmospheric conditions creating a fire hazard, the well had to be shut in.

Oklahoma County.—Gulf Oil Corp. 1 Beck, SW SW SW 15-14n-2w, east of the Northeast Edmond pool, after perforating opposite the Hunton lime at 5,824-49 ft., was acidized with 1,000 gal., headed up and made a 20-bbl. flow with about 500,000 cu. ft. of gas. It may be reacidized.

Canadian County.—Amerada Petroleum et al 1 Lawson, NE NE NW 18-11n-5w, near Mustang, was drilling in second Wilcox at 9,363 ft., after topping the sand at 9,338 ft., and finding light stains in cores from 9,343-48 ft.

Cleveland County.—O. G. Harp Poultry & Egg Co. 1 Matthesen, NE NW NE 19-10n-2w, is drilling at 7,731 ft., headed for a Wilcox test, passing up temporarily the Bartlesville sand from which it had one flow of 1,315 bbl. in 24 hours, before going dead.

OKLAHOMA WILDCAT COMPLETIONS

Grant County: Texas 1 Pierce, SE SE NE 32-29n-8w, dry, TD 5,925 ft., Viola 5,490 ft.

Kingfisher County: Anderson-Prichard 1 Collett, SE NW 25-15n-5w, flowed 220 bbl. in 15 hours from pay zone 7,030-40 ft., TD 7,283 ft., May 6,750 ft., Woodford 6,925 ft., Hunton 6,985-7,045 ft.

Logan County: Cities Service 1 Gaffney, SE NE 29-15n-4w, flowed 88 bbl. oil and 2,500,000 cu. ft. gas from pay zone 6,424-52 ft., TD 6,987 ft., Bartlesville 6,424 ft., Mississippi lime 6,616 ft., Woodford 6,644 ft., Hunton 6,698 ft.

Love County: Sinclair Prairie 1 Smith, NE SW NE 34-6s-2w, dry, TD 9,125 ft., Simpson 8,893 ft.

Stephens County: Carter 1 Frensley "C" 114, NE NE 12-1n-6w, dry, TD 6,298 ft., black shale 6,213 ft.

N. CENTRAL TEXAS

Grayson County Test Has Producer Promise

WICHITA FALLS.—Pure Oil Co. 1 Quentin Little, Grayson County wildcat which last week had sufficient shows to promise commercial production from lime and sand between 8,930-9,068 ft., probably in the Simpson section of the Ordovician, has found additional oil shows. It topped soft dolomite showing oil at 9,151 ft., believed to be Ellenburger, cored from 9,153-60 ft. with recovery of 6 ft. of dolomite showing oil and is drilling ahead at 9,162 ft., at drilling-time rate of 17 minutes per foot. Located in the J. Myers Survey A-1,443, 2 miles southwest of Gordonville, it promises to open the deepest Ordovician production yet found in North Texas and also to be the most southeasterly Ordovician producer in the North Texas-Oklahoma area. It is about 7 miles south of the Red River, and about 30 miles southeast of Ardmore.

Texas Co. 1 Handy, Grayson County wildcat in Sam Stewart Survey, extreme northwest part of the county, has been plugged at total depth 3,939 ft. In northeastern part of the county, A. L. Andree et al 1-A Whiting Estate, D. Dugan Survey, has drill pipe stuck at total depth 3,050 ft.

Jack County.—A. R. Dillard 1 Marley, wildcat 5 miles east of Bryson, in Section 4, WCRR Survey, is making a drill-stem test at total depth 3,080 ft. in sand showing oil. New wildcat location for a 4,500-ft. test is Thos. D. Humphrey 1 First State Bank et al, NW SE, Section 2, BS&F Ry. Survey No. 2, near the Young County lime.

Cooke County.—A. G. Hill 1 Atcheson, 8 miles southwest of Muenster, is running electric log at total depth 3,050 ft. Shallow sand around 1,600 ft. may be tested if electric log indicates possibilities. Sun Oil Co. 1 Butler, Sivels Bend field, is drilling at 4,400 ft. New location is 1 Faye L. Thompson, John McKerley Survey, an 8,000-ft. test 1¾ miles north of Sivels Bend.

NORTH CENTRAL TEXAS WILDCAT COMPLETIONS

Clay County: Anderson-Prichard Oil Corp. 1-A R. O. Wood, 990 ft. from NL, 990 ft. from EL, Sec. 12, MEP&P Sur., 7 mi. S and 1 mi. W Petrolia, elev. 968 ft., Caddo 5,879 ft., Simpson 6,157 ft., Ellenburger 6,505 ft., IP 379 bbl. day through 5/8-in. choke, gas-oil ratio 450 to 1, gravity 42°, TD 6,672 ft.

Nixon Petroleum Co. 1 W. R. Lyon, Blk. 52, Byers Bros. subd., 1 mi. N Petrolia, dry, TD 1,357 ft.

Cooke County: Phillips Petroleum Co. 2 Bailey Inglish, J. F. Davidson Sur. A-336, 3 mi. W and 1 mi. S Hood, elev. 917 ft., schist 2,415 ft., dry, TD 2,439 ft.

King County: Ohio Oil Co. 1 W. R. Ross, 1,980 ft. from NL and 330 ft. from WL Sec. 24, R. B. Masterson Sur. A-1163, 15 mi. E and 3 mi. S Guthrie, elev. 1,716 ft. Gr., flowed 1,320 bbl. day through ½-in. choke, gas-oil ratio 258 to 1, gravity 36.9°, TD 5,257 ft.

Throckmorton County: Cochran & Cain 1 Mrs. Zula Morrison, Brooks & Burleson Sur. A-35, 9 mi. S and 2 mi. W Throckmorton, dry, TD 850 ft.

Wichita County: R. J. Rodocker 1 Westmoreland Swimming Pool, Sec. 9, J. A. Scott Sur. A-305, ¼ mi. S Wichita Falls, elev. 944 ft., dry, TD 360 ft.

Wilbarger County: Pennowa Oil & Gas Co. 1 Waggoner National Bank, Blk. 45, Waggoner Colony lands, 1½ mi. W and 7 mi. N Harrold, dry, TD 700 ft.

Young County: Fleming Oil Co. 5 M. K. Graham, Sec. 2912, TE&L Sur., 8 mi. W and 5 mi. S Newcastle, elev. 1,207 ft., IP 5,000,000 cu. ft. gas day, TD 608 ft.

WEST CENTRAL TEXAS WILDCAT COMPLETION

Taylor County: The Texas Co. 1-D Henry Sayles, Jr., subd. No. 10, W. R. Willis Sur. No. 122, 5 mi. SE Merkel, elev. 1,801 ft., Flippen 2,293 ft., pumped 21 bbl. day through 2-in. tubing, TD 2,310 ft.

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 20 crude oil	Distillate, allied products	January PAW quota all oils	Jan. 13 crude oil
Arkansas	81,700	4,900	84,900	81,400
California	887,750	59,800	947,800	887,750
Colorado	8,800	.....	9,500	8,550
Eastern	62,100	8,550	76,750	62,450
Illinois	198,600	12,000	212,000	203,400
Indiana	12,600	.....	12,500	13,100
Kansas	276,550	6,000	280,000	272,650
Kentucky	30,400	2,800	34,800	29,600
Louisiana	358,200	36,000	391,000	358,250
North Louisiana	69,000	.....	.....	69,050
South Louisiana	289,200	.....	.....	289,200
Michigan	42,550	600	47,600	50,700
Mississippi	47,600	.....	53,300	50,150
Montana	22,600	350	23,350	22,600
Nebraska	1,000	.....	1,200	1,000
New Mexico	103,150	5,600	110,600	103,100
Oklahoma	362,500	26,000	378,000	360,750
Texas	2,120,350	150,000	2,274,000	2,120,350
East Texas	370,900	.....	.....	370,900
East Central Texas	144,050	.....	.....	144,050
North Central Texas	143,150	.....	.....	143,150
Texas Panhandle	88,700	.....	.....	88,700
West Texas	478,600	.....	.....	478,600
South Central (S. A.)	20,050	.....	.....	20,050
South Texas (Laredo)	78,400	.....	.....	78,400
Lower Gulf Coast	243,900	.....	.....	243,900
Upper Gulf Coast	552,600	.....	.....	552,600
Wyoming	94,100	3,500	103,500	92,800
Total United States	4,710,550	316,100	5,040,800	4,718,600
Change from previous week	down 8,050	.....	.....	.....

Total production January 1-January 20, 1945 ..... 94,068,150 bbl.
Same period last year ..... 87,501,040 bbl.

TEXAS GULF COAST

Brazoria Discovery Flows 300 Bbl. Per Day

HOUSTON.—Glenn H. McCarthy et al 1 Ida Dudley Wilson et al, discovery well about 5½ miles northwest of Angleton, in John Bradley Survey, Brazoria County, was reported cleaning into tanks flowing daily an estimated 300 bbl. of 30°-gravity oil, plus 15 per cent wash water and mud, through ¼-in. choke, with tubing pressure 400-500 lb. This flow is from perforations at 8,698-8,714 ft. Total depth is 10,806 ft., with 7-in. liner set at 6,522-8,868 ft.

Pan American Production Co. 1 R. L. Williams, in CTRR Survey 663, wildcat 8 miles west of Eagle Lake, total depth 9,250 ft., 5½-in. set at 8,977 ft., perforated at 8,805-14 ft., ran drill-stem test using ¼-in. top and bottom chokes, 1,500-ft. water cushion, open 1 hour 38 minutes, flowed salt water with tubing pressure 800 lb. Previous test at 8,910-24 ft. had also recovered salt water. This test is ex-

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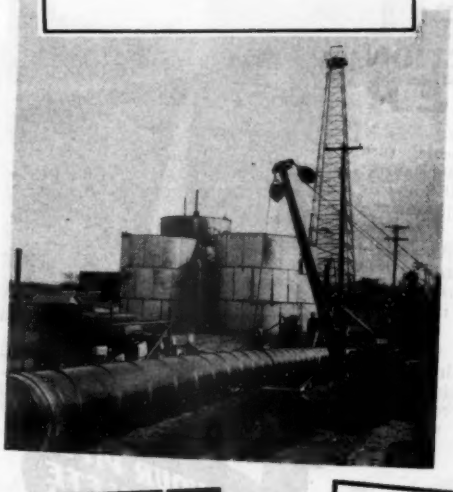

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pected to establish production in sand between 8,372-90 ft.

Humble Oil & Refining Co. 1-B P. C. Cullom et al, a new producer for North Katy area of Waller County, flowed a potential of 71.68 bbl. a day through 3/32-in. choke, with gas-oil ratio 883 to 1, 0.3 per cent water, tubing pressure 1,030 lb., casing pressure 1,625 lb., gravity 42.8°. Production is through five perforations at 6,620½-22 ft. Total depth is 6,865 ft., with plugged back total depth 6,628 ft.

Stanolind Oil & Gas Co. 1 George Lingnau, in BBB&C Survey, a mile northwest of production at Big Creek field, in Fort Bend County, flowed at the rate of 235 bbl. pipe-line oil daily through ⅛-in. choke for completion in perforations at 6,278-82 ft., tubing pressure 1,250 lb., casing pressure 1,400 lb., gas-oil ratio 660 to 1, gravity 33°. Total depth of the hole is 6,462 ft., plugged-back depth 6,290 ft., with 7-in. casing set at 6,331 ft.

Gem Oil Co. 8 Davis & Holmes, new Sparta well at Livingston, Polk County, flowed potential of 347.28 bbl. day, ¼-in. choke, from perforations in sand topped at 6,114 ft., tubing pressure 550 lb., no water. Total depth is 6,175 ft., with plugged-back total depth 6,130 ft.

Navidad Co. 1 W. K. Conner, wildcat, in E. C. Ogden Survey, Abstract 543, about 4 miles south of El Campo, Wharton County, is dry at total depth 7,262 ft. This is second dry hole during past week in this area as J. A. Gray et al 1 Biskin, 3½ miles southeast of El Campo, was dry at 7,208 ft.

UPPER GULF COAST WILDCAT COMPLETIONS

Jackson County: Seaport Oil Co. 1 Joe Klink, Ramon Musquez Grant, 1½ mi. northwest of Vanderbilt, dry at 6,953 ft.

Sterling Oil & Refining Co. and Stewart Boyle 1 H. A. Meyer, Sutherland Sur., Abs. 75, about 5 mi. south of Ganado, TD 5,052 ft., perf. 4,952-57 ft., PT est. 2,700,000 cu. ft. gas, ¼-in. choke, TP 1,700 lb., CP 1,850 lb.

Wharton County: J. A. Gray and John Mayo 1 Abe Biskin, ETRR Sur., Sec. 17, 3½ mi. southeast of El Campo, dry at 7,208 ft.

Navidad Co. 1 W. K. Conner, E. C. Ogden Sur., Abs. 543, 4 mi. south of El Campo, dry at 7,262 ft.

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SOUTH LOUISIANA

New Yegua Sand Opened In Mystic Field

NEW ORLEANS.—Yegua Corp. 1-B Lutcher-Moore Lumber Co., Section 28-6s-12w, in Mystic (Fields) field, Beauregard Parish, has opened a new Yegua sand. At a total depth of 8,250 ft., with 5½-in. casing at 8,243 ft., it was perforated with 18 shots from 8,223-26 ft., and flowed at the rate of 216 bbl. a day on 10/64-in. choke, tubing pressure 1,550 lb., shut-in pressure 1,650 lb., gravity 46°, gas-oil ratio 1,100 to 1. This sand is lower than the Bancroft sand. Operators are preparing to run state potential.

Barnsdall Oil Co. 2 Fuselier, Section 38-7s-3w, at West Tepetate, in Jefferson Davis Parish, is preparing to test the Miller sand, total depth 9,236 ft. A drill-stem test at 9,071-84 ft. had recovered salt water with small amount of oil. The company's 3 Fuselier, Section 38, is drilling ahead at 6,845 ft.

SOUTH LOUISIANA WILDCAT COMPLETIONS

Acadia Parish: Continental Oil Co. 1 Mrs. L. D. Thibodeaux, Church Point area, 73-7s-2e, dry at 11,008 ft.

Terrebonne Parish: Union Oil Co. of California 1 Gaidry, Houma area, discovery well, 22-17s-17e, total depth 12,618 ft., perforations, 23 holes, from 10,290-98 ft., PT estimated 5,000,000 cu. ft. gas and 25 bbl. condensate day, ¼-in. choke, tubing pressure 3,700 lb.

APPALACHIAN FIELD

Second Test Completed In Westmoreland

PITTSBURGH.—In Bell Township, Westmoreland County, Pennsylvania, Peoples Natural Gas Co. completed a second test on John Smeltzer farm with an open flow of 1,400,000 cu. ft. gas from sand topped at 3,242 ft. and gas at 3,294 ft. where well was bottomed.

In Logan County, test of United Producing Co. in Tridelphia district, 1,169 Pardee Land Co. has reached 4,340 ft. with top of the Big lime at 2,485 ft. and the Berea 3,357 ft. This missed the pays in the Big lime.

In Wyoming County, Godfrey L. Cabot, Inc. is acidizing the Big lime in 1,156 Pocahontas Land Corp. with Big lime at 2,685-3,001 ft. and 18,000 cu. ft. of gas at 2,785-90 ft. and some additional at 2,780 ft. Total depth is 3,177 ft.

In Nicholas County, where the new gas field is being exploited in Jefferson district, Columbian Carbon Co. bottomed 7 C. C. Dickinson at 2,047 ft. and is acidizing the Injun sand gas which tested 103,000 cu. ft.

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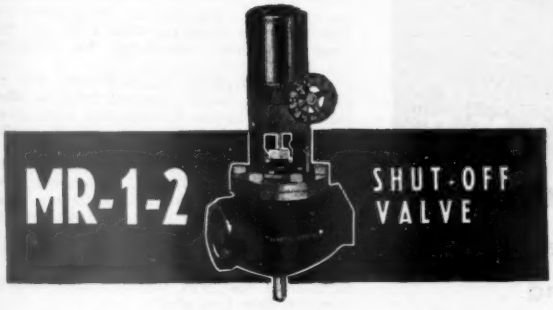

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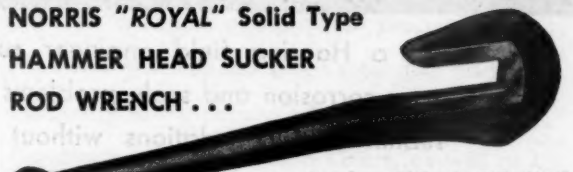

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EASTERN TEXAS

Rodessa Show South of Tyler to Be Tested

DALLAS. — Phillips Petroleum Co. 1 Englander, wildcat about 4 miles southeast of Phillips' deep discovery well in the South Tyler field, is drilling and coring below 9,995 ft. and is rumored to have logged 20 to 40 ft. of porosity, probably in the Rodessa pay zone, but no details are being released. Tanks and separator are already on location. Outcome of this well is awaited with keen interest, particularly because some well-qualified sources have expressed the opinion that South Tyler will develop into one of the largest fields in the East Texas district.

Humble Oil & Refining Co. 1 Pickering, S. Francois Survey, east of Shelbyville, is drilling below 7,138 ft. and operators have indicated it will be carried deep enough to explore the Smackover lime. In Titus County, south of Mount Pleasant, same company's 1 Searcy is drilling just below 11,528 ft. in lime and shale, apparently not yet in the Smackover.

Camp County.—M. E. Davis 1 Mrs. C. A. Shelby, new 8,250-ft. wildcat a mile northeast of Newsome, is moving in materials, on location approximately 470 ft. from west, 2,565 ft. from north lines of Thos. Williams Survey.

Van Zandt County.—Humble 1 W. C. Ayers is a new test 1,320 ft. southeast of Humble 1 Bruce, 4½ miles south of Edgewood, completed recently as a pumper from 8,500-ft. Travis Peak sand.

Heavy leasing and blocking continues on a wide trend running southwest-northeast across Madison, Houston, and Angelina counties, in anticipation of Woodbine sand production from depths ranging from 6,500 to 8,500 ft. on local structures within the trend. Considerable subsurface and geophysical information is available on the area due to extensive but unsuccessful Wilcox sand drilling in the general region during the past few years.

EAST TEXAS WILDCAT COMPLETIONS

Cherokee County: Kennecott Copper 1 W. Hale Est., E. C. Allison Sur., 1½ mi. NE Mixon, elev. 356 ft., Pecan Gap 3,085-3,451 ft., dry, TD 4,008 ft.

Henderson County: Lone Star Prod. Co. 1 R. H. Lee, 660 ft. from EL, 330 ft. from NL B. C. Walters Sur., 2½ mi. N Athens, elev. 432 ft., massive anhydrite 8,020-8,173 ft., Rodessa porosity 8,184 ft., top pay 8,196 ft., James 8,490 ft., Travis Peak 8,943 ft., flowed 262 bbl. day through 5/32-in. choke, gas-oil ratio 1,513 to 1, gravity 47.8°, TD 9,242 ft.

Houston County: A. P. Simmons and W. W. Graham 1 B. Willis, E. W. Goolsby Sur., 4 mi. N and slightly W Lovelady, elev. 308 ft., dry, TD 3,312 ft.

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KANSAS

Cowley County Strike Rated at 153 Bbl.

CREEKMORE & ROONEY 1 Seakatz, NW NW NW 26-34-3e, near Arkansas City in Cowley County, showed for 153 bbl. per day from the Mississippi lime at 3,085-3,105 ft. on a potential test, based on an 8-hour pumping test. On a preliminary test it had looked like a big well.

Barber County has been given a new gas pool by Lion Oil & Refining Co. 1 Lemon, SE NE NE 28-30-13w, northeast of the Marjorie gas pool. After carrying the hole to 4,848 ft. in the Arbuckle, topped at 4,747 ft., perforations were made at 4,528-45 ft., opposite the Maquoketa, and the test was acidized with 1,000 gal. The well has been completed for 18,000,000 cu. ft of gas.

Mouser Drilling Co. 1 Carlin, NE SE SW 13-15-3w, which opened the new Mentor pool in Saline County has been given a potential of 77 bbl. per day from the Viola lime at 3,280 ft.

A possible gas well is indicated in the M. H. Watts and Jeff T. Boucher 1 Boisseau, SE NW 27-31-18w, between Coldwater and Elmore in Comanche County. The test is drilling below 5,157 ft. in Mississippi lime, topped at 5,068 ft. When the formation softened up at 5,114 ft., a drill-stem test was taken, which showed considerable free gas.

KANSAS WILDCAT COMPLETIONS

Barber County: Superior 1 Ward estate, NW NW SW 2-31-15w, dry, TD 4,678 ft., Arbuckle 4,632 ft.

Barton County: Vickers 1 Schmidt, NW NW NE 35-20-15w, dry, TD 3,710 ft., Arbuckle 3,679 ft.

Sunray 1 Ewing, NE NE NW 19-19-14w, dry, TD 3,652 ft., Reagan 3,628 ft.

Phil-Han 1 Grossardt, NW NW NW 6-16-11w, dry, TD 3,360 ft., cherty Conglomerate 3,346 ft.

Cowley County: Adair & Huber 1 Jacobshagen, SW SW SW 6-31-5e, dry, TD 2,968 ft., Mississippi lime 2,928 ft.

Graham County: Maguire Industries 1 Steinmetz, NW NE NW 33-6-22w, dry, TD 4,005 ft., Arbuckle 3,954 ft.

Lane County: Skelly 1 James, NE NE NE 25-16-29w, dry, TD 5,032 ft., Arbuckle 4,945 ft.

Phillips County: Bridgeport 1 Grau "A," SW NW NW 26-3-19w, dry, TD 3,635 ft., Arbuckle 3,605 ft.

Russell County: M. M. Price et al 1 Nelson, NE NE NW 23-13-11w, dry, TD 3,351 ft., Arbuckle 3,335 ft.

Sedgwick County: Branine & Holl 1 Tjaden, SE SE NW 34-29-2w, dry, TD 3,634 ft., Mississippi lime 3,590 ft.

British-American 1 Petrie, NW NE SW 36-26-1w, dry, TD 3,520 ft., Arbuckle 3,505 ft.

Stafford County: Sinclair Prairie 1 Harter, SW NW SW 31-24-13w, dry, TD 4,437 ft., Arbuckle 4,412 ft.

Hinkle Oil 1 Metz, NE NE SE 6-23-12w, dry, TD 3,816 ft., Arbuckle 3,768 ft.

Keyes Drilling 1 Lafland, NW SW NW 28-22-11w, dry, TD 3,631 ft., Dakota 3,629 ft.

Ed Swearer et al 1 Pears, SE SE SE 14-23-14w, dry, TD 4,027 ft., Arbuckle 3,977 ft.

Woodson County: J. C. Jansen 1 Vaughn, SE SE SW 36-24-14e, dry, TD 1,553 ft., Mississippi lime 1,524 ft.

CANADIAN FIELDS

Devonian Yields Show in Steveville-Princess

CHATHAM.—In the Steveville-Princess field, 120 miles east of Calgary, Empire Petroleums 1, LSD 7, 11-9-11w4, showed oil and gas with no water in a drill-stem test in the Devonian limestone at 4,086 ft. Pinpoint porosity was present through most of the dolomite to that level, and coring is continuing below 4,104 ft. Devonian contact was 4,065 ft. Location is 11 miles southeast of the California-Standard Princess-C.P.R. 18-21-A discovery well which entered the lime at 3,913 ft. and the oil-bearing porous horizon at 3,965 ft. with initial production around 200 bbl.

Devonian tests.—Several wells in various parts of Alberta are testing the Devonian limestone, commercially productive for the first time in the province in Princess-C.P.R. 18-21-A in the Steveville field. In the Atlee area, north and west, Goyette-

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Solloway 1, LSD 9, 30-20-7w4, nonproductive in the Devonian at 3,918-4,279 ft., is deepening for a thorough test. In the Bullshead area, south and west, McColl-Bullshead 14-34-8-7, LSD 14, Section 34-8-7w4, is in Devonian below 3,540 ft. Several new wells designed to test the same formation are being started.

Jumping Pound.—On the Jumping Pound structure, in the foothills 25 miles west of Calgary, Shell Exploration 4-24-J, LSD 4, 24-25-5w5, testing Madison at 9,947 ft., got a maximum naphtha recovery of 96 bbl. a day with maximum gas flow around 11,700,000 cu. ft. The well is shut in pending study of the results of tests with varying chokes and back pressures. Location will be made for a second well.

Ram River.—In the northern foothills west of Rocky Mountain House, Ram River Oils 3, LSD 12, 1-37-11w5, has encountered oil showings in Devonian limestone at 5,248 ft.

ROCKY MOUNTAIN

Texas Co. Gets Year's First Rocky Mountain Discovery

DENVER.—Credit for the first discovery in the Rocky Mountain area in 1945 goes to Texas Co. 1 Carl Ekholt, NW SW NW 3-32n-1e, between the Shelby and Devon gas fields in Toole County, Montana. It had the Sunburst at 1,365-92 ft. with a show of oil at 1,382-92 ft., the top of the Ellis at 1,520 ft., and the Madison at 1,651 ft. It was completed at 1,653 ft., total depth, and pumped 37½ bbl. of 31°-gravity oil in 19½ hours. After the head was pumped off, it produced at the rate of 0.7 bbl. per hour. It is strictly wildcat territory.

Tensleep extension at Steamboat Butte.—British American Oil Producing Co. 3-C Tribal, in NE SW SW 29-4n-1w, the second well to be completed in the Tensleep sand in the Steamboat Butte field, Fremont County, Wyoming, was drilled to 7,104 ft., 107 ft. below top of pay, and flowed 7 bbl. per hour natural. It will be put on the pump. The location is ⅜ mile north and a little east of the Tensleep discovery last spring. The discovery flowed approximately 8 bbl. an hour, but when put on the pump made 570 bbl. in 24 hours. This is the most northerly completion in the field, being 1¼ miles due north of the Sundance sand discovery and 1½ miles north of the Lakota sand discovery.

Failure at Haymower.—A test of the Tertiary beds on the Haymower structure, 6 miles west of the West Hiawatha field, Moffat County, Colorado, in Pacific Western Oil Corp. 1 Unit, in NE NW NW 30-12n-101w, was dry at 4,030 ft. The well started in the Wasatch formation of Tertiary age and stopped at the base of that section. No shows were encountered.

Tensleep show at Oil Mountain.—Texas Co. 1 Clark, in NE NE SW 35-33n-82w, a test to the Madison on the Oil Mountain structure west of Casper, picked up the Tensleep at 2,622 ft., and at 2,805 ft. had penetrated 183 ft. of that formation, of which 170 ft. showed some saturation in the cores. The pressure, however, is low. It is reaming at 2,300 ft., and will test.

COLORADO WILDCAT COMPLETIONS

Haymower, Moffat County: Pacific Western Oil Corp. 1 Unit, NE NW NW 30-12n-101w, TD 4,030 ft., dry and abandoned, no shows.

Round Butte, Larimer County: Iris Oil Co. 1 Munroe, NW NW SW 13-11n-69w, TD 2,070 ft., in Dakota sand, top of Muddy 1,887 ft., dry in both sands.

WYOMING WILDCAT COMPLETIONS

North Cole Creek, Natrona County: General Petroleum Corp. 53-8-G, NW SW NE 3-35n-77w, dry, TD 4,960 ft., water in Shannon sand at 4,930 ft.

South Sunshine, Park County: Continental Oil Co. 3 Wolf Lot 4, 9-48n-101w, dry, TD 3,064 ft., top Embar 2,570 ft., top Tensleep 2,910 ft., water.

Steamboat Butte, Fremont County: British-American Oil Producing Co. 3-C Tribal, NE SW SW 29-4n-1w, TD 7,104 ft., top Tensleep 6,977 ft., flowed 7 bbl. per hour natural through perf. from Tensleep, will put on pump, extension of Tensleep pay.

MONTANA WILDCAT COMPLETION

Devon Prospect, Toole County: Texas Co. 1 Ekholt, NW SW NW 3-33n-1e, TD 1,653 ft., top of Madison 1,651 ft., pumped 37½ bbl. in 19½ hours, 31° gravity.

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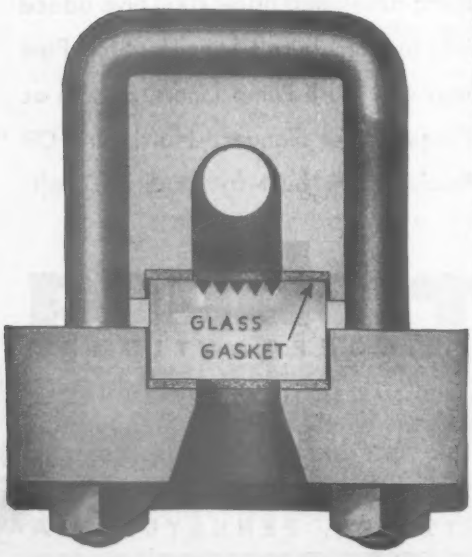

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SOUTHWEST TEXAS

Kleberg County Test Gets Production in Frio Sand

CORPUS CHRISTI.—Tide Water Associated Oil Co. 1 E. W. House, wildcat, 2 miles northeast of Richardo, in Block 36 of Kleberg Town & Improvement Subdivision, Kleberg County, flowed into pits 6 to 7 bbl. per hour, on 3-hour drill-stem test, through perforations at 7,266-68 ft. (Frio sand), ¼-in. and ⅛-in. chokes, 1,250 lb. working pressure, gas-oil ratio 1,000 to 1, gravity 37.2°. Total depth is 8,650 ft., with 5½-in. casing set at 8,515 ft. Operators are now running tubing for completion.

W. Earl Rowe 2 Nona Berry Davis, wildcat, 4 miles southeast of Clareville, in the Bee County School Land Survey, Abstract 101, Bee County, recovered 40 ft. of oil and about 40 ft. of oily drill mud

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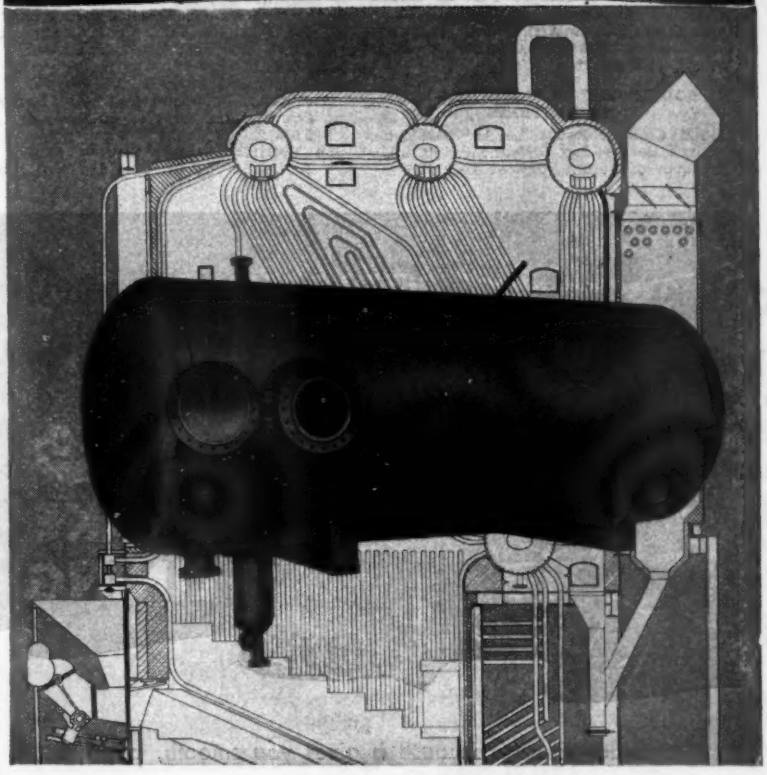

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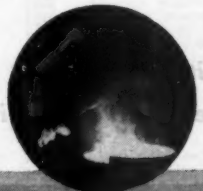

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on drill-stem test in Pettus sand at 3,612-18 ft., with 8 lb. top pressure. Drill-stem test at 3,618-22 ft. had about the same recovery. Now drilling ahead from 3,622 ft. in shale.

Humble Oil & Refining Co. 1 Sullivan, wildcat, 8 miles southeast of Falfurrias, in M. D. Floyd Survey 152, Brooks County, recovered 630 ft. of fluid, 180 ft. oil-cut mud, 90 ft. oil, and 90 ft. of oil and salt water, 10 per cent oil, through perforations at 7,779-91 ft Total depth is 7,791 ft.

Rowan-Hope & Ranger 1 J. C. Wallis, wildcat, 4 miles south of Westhoff, H. P. Cook Survey, in DeWitt County, is coring ahead below 5,480 ft. Operators topped Wilcox at 5,284 ft.

SOUTHWEST TEXAS WILDCAT COMPLETIONS

Goliad County: Lewis Lawlor 1 Magdalena Berger, Jas. O'Neal Sur., 10 miles north of Fannin, dry at 4,552 ft.

Duval County: R. H. Hawn 1 Leroy Denman, 3 mi. east of Realitos, Sec. 21 of Copita Farm & Gardon Tract, dry at 5,615 ft.

Jim Hogg County: F. B. Lefevre 1 A. Martinez et al, Blk. 91 of Las Animas Grant, 12 mi. southeast of Hebbronville, TD 2,007 ft., open hole 1,767-73 ft., PT 14 bbl. oil daily on pump, 33⅓ per cent water, gravity 19.1°.

Jim Hogg County: Earl H. Smith 1 R. H. and Ella McCampbell, Las Uinoritas Grant, 12 mi. south of Hebbronville, dry at 4,750 ft.

Live Oak County: Hewit & Dougherty 1 R. B. Mahan, C. Claunch Sur., Lot 39, 5 mi. east of Whitsett, dry at 5,022 ft.

Nueces County: Sam E. Wilson, Jr. 1 F. J. Smith, Mariano Lopez De Herrera Grant, 1 mi. west of Calallen, dry at 5,946 ft.

San Patricio County: Sinclair Prairie 1 Daniel P. Moore, Geo. H. Paul subd. of Coleman-Fulton Pasture Lands, Sec. 79, 5 mi. southwest of Gregory, dry at 9,970 ft.

Starr County: George H. Echols 1 Starr County Cattle Co., Porc. 89, 10 mi. northeast of Rio Grande City, dry at 3,113 ft.

George Irving 1 M. M. Garcia, Irving discovery, Porc. 90, Tract 215, 35 mi. northeast of Rio Grande City, TD 3,520 ft., perf. 24 holes from 3,288-92 ft., PT 57,000,000 cu. ft. wet gas daily, open flow, TP 1,000 lb., ⅛-in. choke.

Willacy County: Texas Co. 2 Yturria Bros. Land & Cattle Co., Raymondville discovery, San Juan de Carricitos "Jose Narcisco Cabazos" Grant, Share 4, TD 8,015 ft., perf. 8 holes, from 6,380-82 ft., PT 47 bbl. daily, ⅛-in. choke, gas-oil ratio 556 to 1, TP 225 lb., gravity 42.9°, 7 per cent b.s. and w.

Karnes County: Southern Minerals Corp. 1 Jose Bartosch Falls City discovery, Louis Manchaca Sur., Abs. 5, 1 mi. north of Falls City, TD 4,711 ft., perf. 15 holes, from 5,651-54½ ft., PT 58.20 bbl. fluid daily, ⅛-in. choke, TP 125 lb., gravity 45.6°, 67 per cent fresh water.

Zavala County: F. M. Ginther 1 Charles D. Matthews, I&GN Sur., 8½ mi. northwest of LaPryor, dry at 2,505 ft.

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ILLINOIS

Deepening Bennington Well Brings Good Results

CENTRALIA, Ill.—Of the 35 wells completed during the past week, 24 were oil wells with an average initial production of 133 bbl. per well. The only oil well among the wildcats completed was an 8-bbl. producer in Richland County from a 3,000-ft pay.

Burr Lambert deepened 1 Von Schoick in 18-1n-10e, Bennington pool, Edwards County, with excellent results. The well was reported completed early in December with an initial of 243 bbl. from McClosky lime at 3,216-17 ft., total depth. The hole was deepened to 3,245 ft. and acidized, and responded with a 24-hour production of 675 bbl., pumping and flowing.

Texas Co. completed a 390-bbl. well in McClosky lime in the Divide West field in Jefferson County. W. Duncan 2 Patterson, in 13-3n-8e, Noble pool Richland County, started off at 317 bbl. per day.

Only 31 new operations were started during the week including these 7 wildcats: Russell Murray 1 Kurtz, NE NE NE 21-3n-10, Richland County; Magnolia 1 M. Camman, NE SE NE 16-4n-7e, Clay County; Pure 1 Ira Hasher-A, NE SE NE 1-3n-8e, Richland County; Sohio 1 J. Talbert, SW SW SW 29-1s-6e, Wayne County; B. W. Quick, et al Henning, SE NE NE 31-3n-1e, Marion County; Oil Management 1 Hail, NW SW NE 29-1s-1e, Jefferson County, and St. Clair Oil Development 1 Beste, NE NE SW 11-3n-7w, Madison County.

ILLINOIS WILDCAT COMPLETIONS

Douglas County: Ohio 1 Shaw, SW SW SW 36-16n-8e, dry at 4,151 ft. No log.

Franklin County: Leonard Oil 1 T. J. Crowe, Tr., NW NW NW 1-7s-3e, dry at 3,197 ft. Menard 2,160 ft., Cypress 2,735 ft., Benoist 2,884 ft., Aux Vases 2,970 ft., McClosky 3,115 ft., St. Louis 3,192 ft.

Hancock County: James H. Barton 1 Blunt, NE NE NE 15-3n-5w of 5th p.m., dry at 990 ft.

Marion County: C. A. Baldwin 1 Nicols, SW SW NW 28-3n-1e, dry at 1,026 ft.

Richland County: Fulk & Craven 1 Lloyd Sager, SE NE SW 7-3n-9e, TD 3,101 ft., PB to 3,030 ft., acidized through perforations at 3,014-18 ft. and 2,996-3,006

ft., pumped 8 bbl. of oil, 25 bbl. of water.

Washington County: Bennett Bros. 1 Baldwin, SE SW NE 19-1s-3w, dry at 2,660 ft. Glen Dean 854 ft., Cypress 1,034 ft., Benoist 1,188 ft., Aux Vases 1,299 ft., McClosky 1,441 ft., Salem 2,598 ft., Devonian 2,580 ft.

Wayne County: Skelly Oil and United Producers 1 E. A. Hoover, NE NW SW 1-1n-5e, dry at 3,055 ft., Upper Kincaid 1,853 ft., Cypress 2,571 ft., Benoist 2,775 ft., Aux Vases 2,853 ft., McClosky 2,961 ft.

PERMIAN BASIN

Hockley County Wildcat To Test Lime Showing

MIDLAND.—Stanolind Oil & Gas Co. 1 Yellowstone Land Co., Hockley County wildcat 2 miles northeast of the Yellowstone pool, logged broken dolomite lime showing oil from 4,549-96 ft., total depth, and has cemented casing to test. It is in Labor 2, League 718, Capitol Lands. Texas Pacific Coal & Oil Co. 1 Rucker, a 7,500-ft. test on north edge of the 5,000-ft. Slaughter field, is drilling below 7,255 ft. in lime.

Fikes & Murchison 1 Alexander, northwestern Terry County discovery which has been shut down for several weeks to install pumping equipment on pay at 5,088-5,157 ft., is estimated good for 150 to 200 bbl. daily on initial pumping tests.

Andrews County.—Humble Oil & Refining Co. 88-X J. S. Means, first Ordovician test in the 4,500-ft. Means field, has spudded on an 11,000-ft. contract. Union Oil of California 1 Biles, Union pool deep test, is drilling ahead from 8,621 ft. Magnolia Petroleum Co. 1-A Ralph, just west of Fullerton field, is drilling at 9,560 ft. in hard chert. Stanolind 1-D University, wildcat 5 miles northwest of the Embar field, has plugged back from total depth of 10,460 ft. in Ellenburger lime to 9,200 ft. and is running pipe to test shows of oil and gas found in the Silurian, Devonian, and lower Permian beds.

Ward County.—Lion Oil Refining Co. 3-B University, 990 ft. east of the Delaware sand discovery producer 3 miles west of Pyote, topped Delaware lime at 4,956 ft., slightly low to the discovery, and has cemented pipe at 4,921 ft., total depth 4,992 ft., before drilling ahead into the sand. Cities Service, Inc. 1 Thornton is a new location for a 3,000-ft. wildcat in NE NE, Section 80, Block 34, about 4 miles west of reef lime production in the North Ward area.

WEST TEXAS WILDCAT COMPLETIONS

Cochran County: Helmerich & Payne 1 D. S. Wright, Labor 1, League 95, Mills CSL, 5 mi. W Whiteface, elev. 3,751 ft., dry, TD 6,522 ft.

Crockett County: Watchorn Oil Co. 2 G. L. Thompson, Sec. 74, Blk. 1, I&GN Sur., elev. 2,292 ft., dry, TD 1,179 ft.

Gaines County: Rowan Drlg. Co. 1 H. C. Schumaker, Labor 2, League 298, Reagan CSL, 17 mi. SW Cedar Lake, elev. 3,048 ft., Yates 3,330 ft., San Andres 5,205 ft., dry, TD 5,555 ft.

Kimble County: Phillips Petroleum Co. 1 Hugh Spiller, Sec. 10, Brooks & Burleson Sur., 12 mi. NW Junction, elev. 2,227 ft., Ellenburger 2,372 ft., granite 4,229 ft., dry, TD 4,264 ft.

Lynn County: Phillips Petroleum Co. 1-A Bartley, Sec. 1372, Blk. 1, BS&F Sur., 11 mi. E Tahoka, elev. 2,981 ft., Ellenburger 9,352 ft., granite 9,900 ft., dry, TD 9,909 ft.

Lubbock County: The Norwalk Co. 1 Nislar, S NW NE Sec. 23, Blk. AK, HE&WT Sur., 2 mi. E Wolfforth, elv. 3,311 ft., dry, TD 6,313 ft.

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Fig. 108 See Acme — Composite Catalog.

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Pecos County: R. B. Rawlins 1 F. J. Ellyson, Sec. 32, Blk. 140, T&STL Sur., elev. 2,519 ft., dry, TD 1,370 ft.

Lamb County: Humble Oil & Refg. Co. 1 J. A. Jackson, 660 ft. from NL, 1,980 ft. from WL Sec. 119, Blk. A, R. M. Thompson Sur., 14 mi. SE Littlefield, elev. 3,461 ft., granite 7,185 ft., plugged back to 6,036 ft., top pay 5,352 ft. pumped 248 bbl. day, gas-oil ratio 160 to 2, gravity 34°, TD 7,191 ft.

TEXAS PANHANDLE

AMARILLO.—Humble Oil & Refining Co. 1 Hyslop, Deaf Smith County wildcat just east of the New Mexico state line, is running casing to test. Bottomed at 6,784 ft. in granite wash topped at 6,510 ft., it topped Clear Fork at 5,190 ft., Cisco at 6,090 ft. Full information on this test, which may open a new field in the Panhandle section, is not available. Some weeks ago it was rumored to have recovered 1 gal. oil and about 420 ft. oil-cut mud on drill-stem test at 6,510-24 ft., in top of granite wash section.

SOUTHEASTERN NEW MEXICO

HOBBS.—Gulf Oil Corp. 1 Andrews-State, Lea County wildcat 1¾ miles southeast of the 6,400-ft. Drinkard discovery well and in Section 32-22-38, is drilling below 5,805 ft. It missed the gas show encountered in top of the Clear Fork by the discovery. Gulf Oil Corp. 1 Gutman, north offset to 1 Drinkard, recoverd 90 ft. of distillate with 540 ft. mud and water on drill-stem test at 5,478-5,535 ft. in top of the Clear Fork zone and is drilling ahead below 5,700 ft. Humble Oil & Refining Co. 1 Federal-Keinath, deep wildcat in Section 8-21-38, logged granite from 9,951-54 ft., total depth, and has plugged back to test showings above 7,500 ft.

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Humble 1 Federal-Leonard, Section 12-26-37, first Ellenburger producer in New Mexico and deepest producer in Permian Basin, on completion gage flowed 297 bbl. of 50°-gravity oil in 24 hours through 5/32-in. choke, gas-oil ratio 2,465 to 1, flowing 1,050 lb. on tubing, 2,050 lb. on casing. It topped Ellenburger at 11,816 ft., with pay coming through casing perforations at 11,895-933 ft. On the south edge of West Eunice field, Stanolind Oil & Gas Co. 1-P State, Section 24-21-34, which blew out making over 500 bbl. hourly, after setting casing and running tubing averaged 16 bbl. hourly through 10/64-in. choke, from total depth 3,820 ft.

SOUTHEASTERN NEW MEXICO WILDCAT COMPLETIONS

Lea County: Continental Oil Co. 2-B-23 Skaggs, C SW NW 23-20s-37e, elev. 3,540 ft., Wolfcamp discovery, Devonian 8,220 ft., Montoyah 9,395 ft., Simpson 9,775 ft., top pay 7,700 ft., flowed 269 bbl. day through ¾-in. tubing choke, gas-oil ratio 150 to 1, gravity 42.3°, TD 10,465 ft.

Rowan Drlg. Co. 1 Federal-Simmons, C SE SE 18-10s-38e, elev. 3,919 ft., Yates 3,000 ft., San Andres 4,300 ft., dry, TD 5,237 ft.

MICHIGAN

Deep River Field Gets Another Big Well

SAGINAW.—Michigan's deepest oil test in more than a year was pronounced a failure last week and Arenac County's Deep River field was adding another gusher to its list, a well rating better than 225 bbl. an hr. open initial flow.

The deep test failure, one of seven dry hole wildcats on the completions list of 11 tests, was the I. C. Chamness 1 Roddenberry, section 27, Salem township, Washtenaw County. It was drilled to 6,095 ft. and the test abandoned in a shelf of granite.

The Deep River gusher, Basin Oil Co.-Don Rayburn 2 Klenk, in section 8, came in at 2,821 ft. Isabella and Bay County each provides one small producer and E. D. Dailey completed the first gas well of the year in the Crystal field of Montcalm county.

The state conservation department, which issued six new drilling permits, announced the year's first auction of oil and gas rights on state-owned lands will take place Feb. 2, the offering consisting of 26,337 acres in Arenac, Ionia, Mason, Mecosta, Missaukee, Montcalm, Newaygo, Oceana, Osceola, Roscommon, Saginaw and Wexford counties.

MICHIGAN WILDCAT COMPLETIONS

Lapeer County, Burnside Township: Clarence Wilcox 1 Butler, SW NE SE 27-10n-12e; dry in Berea; TD 1,383 ft.

Mecosta County, Hinton Township: Chapman Oil Co. 1 Stephens, C-S½ NW NW 35-13n-8w; dry in Dundee; TD 3,661 ft.

Mecosta Township: Neil Wagenaar-Fischer-McCall Oil & Gas Co. 1 Lane et al, NE NW NW 3-14n-10w; dry in Monroe; TD 3,625 ft.

Montcalm County, Bushnell Township: H. L. Wadsworth-H. M. McClure 1 Wilson, SW SW SW 5-9n-6w; dry in Marshall; TD 1,238 ft.

Ogemaw County, Goodar Township: Arenac Oil & Gas Co. 1 Michaelsom. C-NW 34-24n-4e; dry in Berea; TD 1,616 ft.

Osceola County, Richmond Township: Pure Oil Co. A-1 Haist, C-N½ SE SW 25-17n-10w; dry in Michigan Stray; TD 1,363 ft.

Washtenaw County, Salem Township: I. C. Chamness 1 Roddenberry et al, NE SE NE 27-1s-7e; dry in granite; TD 6,095 ft.

CALIFORNIA

New Field Probable Near Del Valle

LOS ANGELES.—California will probably soon have another new oil field and a new deep zone in a proven field. The new field possibility is about a mile east of the Del Valle field in upper Los Angeles County. Russ Havenstrite, discoverer of the Del Valle field, has found very encouraging showings in his 2 Liebhart, which may make a flowing well. Oil sand of Miocene age was topped at 9,535 ft., and the bit was still in sand at 9,660 ft., although there were intervals of dry shale sections.

The probable new deep zone is located in the Newhall Potrero field, where Barnsdall has found several possible productive horizons in a deep test. Present depth is 10,613 ft., in what is designated as the seventh zone, believed to be lower Miocene.

CALIFORNIA WILDCAT COMPLETIONS

Covina wildcat district, Los Angeles County: Texas Co. 27-1 Covina, 7-1s-9w, abandoned as unproductive, minor showings tested wet, TD 5,054 ft.

Magunden wildcat district, Kern County: Gene Reid Drilling Co., 1 Magunden, 34-29s-28e, abandoned in gray sand, no showings of importance, TD 6,717 ft.

Rosecrans outpost well, Los Angeles County: Wilshire 1 Central Heights, 21-3s-13w, abandoned as not productive commercially, cored some sand in 9th Callender zone of Miocene age, TD 8,567 ft.

Whittier outpost well, Los Angeles County: Bishop-Hilo 1 Pellissier, 4-2s-11w, abandoned in gray sand, anticipated sand absent, no showings, TD 3,700 ft.

LA.-ARK.

Offset to Delhi Discovery Shows for a Producer

SHREVEPORT.—Sun Oil Co. 1-B Holt, SE NE 21-17n-9e, diagonal southeast offset to the Delhi pool discovery well, had top of sand at 3,220 ft., gas-oil contact at 3,227 ft., and on drill-stem test at 3,241-52 ft., open 10 minutes, recovered 1,700 ft. of oil. It is reported checking 28 ft. higher structurally than discovery well, but the sand appears tighter.

Natchitoches Parish.—The California Co. 1 Annie Morrison, in NE 12-13n-8w, on which official information is withheld, is attracting great interest. Located about 15 miles east of the northeast edge of the old Bull Bayou field, this test is reported to be 5,316 ft. deep, to have had favorable showings in the Paluxy sand at about 3,300 ft., and to be making gas from a deeper pay in which cores showed oil.

NORTH LOUISIANA WILDCAT COMPLETIONS

Catahoula Parish: Stanolind et al 1 Jones, SE SE 25-10n-8e, dry, TD 9,237 ft.

Claiborne Parish: Big West Drilling 1 Allgood, SW SW 22-22n-5w, dry, TD 7,915 ft.

Lincoln Parish: J. H. Williams et al 1 Dowling estate, approx. NE NE NE 29-19n-4w, dry, TD 3,500 ft.

Richland Parish: C. W. Sharp et al 1 Cochran-Franklin, NW SE 14-17n-8e, dry, TD 3,440 ft.

ARKANSAS WILDCAT COMPLETIONS

Newton County: William S. King 1 Shouse, approx. SW SW NE 36-17n-19w, dry, TD 714 ft.

Ouachita County: O. F. Whitaker, Tr. 1 Carnes, NE NE NE 34-13s-17w, dry, TD 1,600 ft.

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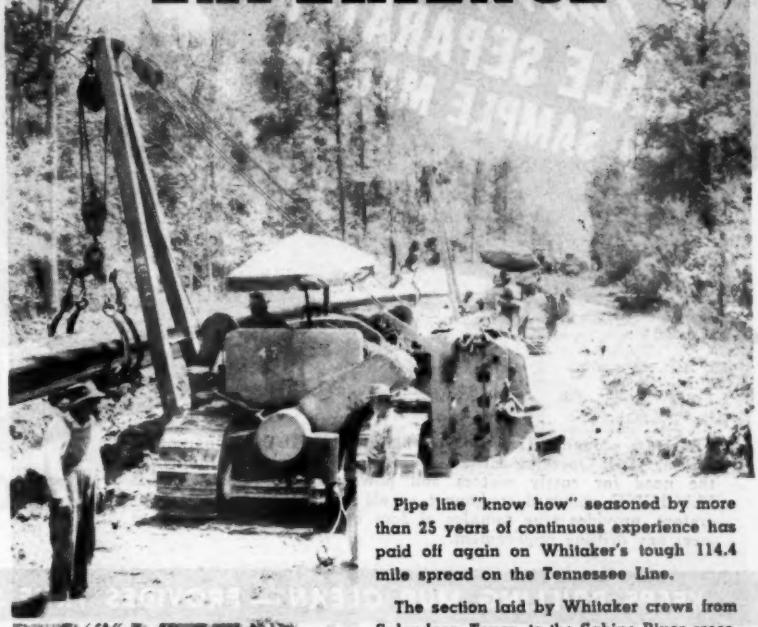

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Tulsa 1, Oklahoma

SUMMARY OF DECEMBER COMPLETIONS*

	Comp.	Oil	Prod.	Gas	Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000-ft.	5,000-10,000 ft.	Over 10,000 ft.	Total footage	Rigs and drilling
N. Y., Penna., W. Va.	432	159	315	101	†172	36	365	30	1	0	808,000	423
Ohio	82	20	600	33	29	9	26	46	1	0	221,028	177
Indiana	25	13	813	1	11	5	14	6	0	0	44,352	42
Kentucky	57	27	3,012	5	25	8	39	10	0	0	115,646	204
Michigan	56	22	4,158	1	33	0	25	31	0	0	130,635	147
Illinois	169	102	10,753	1	66	6	62	101	0	0	446,413	229
Kansas	133	41	5,257	26	66	1	6	123	3	0	437,039	240
Mo., Iowa, Neb.	2	0	0	1	1	2	0	0	0	0	1,762	10
Oklahoma	127	86	48,999	6	35	2	25	57	43	0	542,240	554
Texas:												
North Texas	145	78	12,483	1	66	43	46	29	27	0	368,129	106
West Central Texas	42	14	5,230	3	25	1	14	27	0	0	120,898	38
West Texas	165	144	88,079	1	20	1	16	85	61	2	812,154	486
Texas Panhandle	46	25	4,347	17	4	0	1	45	0	0	142,941	229
Eastern Texas	35	14	1,860	9	12	1	3	6	23	2	226,557	102
Upper Gulf Coast	59	33	6,884	5	21	0	3	6	43	7	405,240	137
Lower Gulf Coast	51	34	5,175	4	13	0	0	7	44	0	338,554	114
S.C. Texas (S.A.)	4	2	83	0	2	1	1	0	2	0	17,483	23
South Texas (Laredo)	39	14	1,622	1	24	0	12	23	4	0	135,700	65
Total Texas	586	358	125,773	41	187	47	96	228	204	11	2,567,656	1,300
Louisiana:												
North Louisiana	36	11	1,059	8	17	0	1	23	12	0	163,154	74
South Louisiana	35	23	5,072	1	11	0	1	0	21	13	324,417	115
Total Louisiana	71	34	6,131	9	28	0	2	23	33	13	487,571	189
Arkansas	27	16	2,795	0	11	0	14	12	1	0	157,243	29
Mississippi	15	8	1,615	0	7	0	5	9	1	0	74,268	70
Ala., Ga., Florida	3	0	0	0	3	0	0	2	1	0	15,473	10
Montana	50	14	1,439	27	9	13	15	17	5	0	116,091	122
Wyoming	27	23	6,104	1	3	2	1	19	5	0	113,890	87
Colorado	7	4	671	0	3	1	1	1	4	0	32,463	33
New Mexico	47	32	6,256	0	15	2	7	31	7	0	159,599	140
California	182	140	36,965	8	34	8	39	91	39	5	718,610	278
Total December	2,098	1,099	261,656	261	†738	142	742	837	348	29	7,189,979	4,284
Total November	2,192	1,154	251,237	251	‡787	112	858	783	393	46	7,264,256	4,441

* Five weeks ending December 30. †Includes 143 service wells. ‡Includes 216 service wells.

OHIO, KENTUCKY

Two Wells Completed on West Side of Clayton Pool

COLUMBUS. — The Clayton pool had two completions along its west edge in Reading Township, Perry County. Industrial Gas Co. 8 Albert Wilson, Section 12, produced 105 bbl. with sand at 3,137-78 ft. Ohio Oil Co. 1 S. I. Forsythe, Section 1, flowed 24 bbl. with 750,000 cu. ft. gas from sand at 3,133-71 ft.

In the Brush Creek field, Industrial Gas 1 Peter-Sime Realty, Section 16, Blue Rock Township, Muskingum County, swabbed 70 bbl. in 15 hours from the Medina sand at 4,421-26 ft.

In the Corning grade field, Pure Oil Co. 1 P. H. Hohman, 1st Qr., Licking Township, Muskingum County, made 52 bbl.

(Continued on page 301)

MISSISSIPPI

Natchez Field Has Its First Condensate Producer

JACKSON, Miss. — Twenty-eight field wells and the same number of wildcats were reported as actively drilling in Mississippi in the roundup of operations.

In the Natchez field, Adams County, Pure Oil Co. 2 McDowell in 12-6n-3w, was completed with a condensate output of 91 bbl. total depth 10,346 ft., the first condensate well in that pool.

In the West Heidelberg field in Jasper County Gulf Refining Co. 2 AL. A. L. McIntosh, NW NW NE 6-10n-10w, made a 200-bbl. well at a total depth of 5,205 ft. Perforations were made at intervals from 4,934 ft. to 5,080 ft. Gulf 4 Mrs. L. P. Thornton, SE NW SE 35-1n-2e, flowed 282 bbl. through 20/64-in. tubing. Total depth is 5,220 ft. Perforations were at intervals from 4,856 to 5,108 ft.

In Covington County Mt. Vernon Car Manufacturing Co. 1 fee, C NE NE 17-9n-16w, was dry at 9,648 ft. Massive sand was topped at 9,483 ft., Lower Cretaceous at 9,528 ft.

One completion was recorded in Alabama. Southern Gas Co. 1 Fannie Stokes, C SW NW 32-12n-5e, was finished at 4,305 ft. No details were learned.

WILDCAT COMPLETIONS AND DISCOVERIES

	Week ended Jan. 20, 1945 Oil	Dist.	Gas	Dry	Total	Cumulative total, 1945 Oil	Dist.	Gas	Dry	Total
Ohio	0	0	0	1	1	0	0	0	3	3
Indiana	0	0	0	0	0	0	0	0	0	0
Illinois	1	0	0	6	7	5	0	0	21	26
Kentucky	0	0	0	1	1	1	0	0	5	6
Michigan	0	0	0	7	7	0	0	0	16	16
Kansas	0	0	0	16	16	1	0	1	31	33
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	5	5
Oklahoma	2	0	0	3	5	5	0	1	17	23
Texas:										
North Central	3	0	1	5	9	5	0	1	18	24
West	1	0	0	7	8	2	0	0	11	13
Panhandle	0	0	0	0	0	0	0	0	0	0
Eastern	1	0	0	2	3	3	0	0	4	7
Gulf Coast	2	0	1	6	9	3	0	1	23	27
Southwest	1	0	1	5	7	1	0	1	16	18
Total Texas	8	0	3	25	36	14	0	3	72	89
Louisiana:										
Northern	0	0	0	4	4	0	0	0	5	5
Southern	1	0	0	1	2	1	0	0	4	5
Total	1	0	0	5	6	1	0	0	9	10
Arkansas	0	0	0	2	2	0	0	0	4	4
Mississippi	0	0	0	3	3	0	0	0	8	8
Ala., Ga., Florida	0	0	0	0	0	0	0	0	1	1
Montana	1	0	0	0	1	1	0	0	0	1
Wyoming	1	0	0	2	3	2	0	0	3	5
Colorado-Utah	0	0	0	2	2	0	0	0	2	2
New Mexico	1	0	0	1	2	1	0	0	5	6
California	0	0	0	0	0	0	0	1	12	13
Total United States	15	0	3	74	92	31	0	6	214	251
Total previous week	7	0	2	84	93					

MISSISSIPPI WILDCAT COMPLETIONS

Jones County: Sohio 1 Huddleston, NW SW NE 3-9n-10w, dry, TD 7,415 ft., Massive sand 7,243 ft.

Lawrence County: Humble 1 Nelson, approx. SW SE SW 8-6n-20w, dry, TD 7,625 ft., in salt.

Warren County: Sinclair-Wyoming 1 Blake, SW SW NW 7-17n-4e, dry, TD 9,090 ft., Lower Cretaceous 7,175 ft.

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"MAN HOURS"

Moving — setting up — drilling — wherever a crew is working with a YOUNG Drilling Engine, you save time. That fact has been well established. Your own figures can quickly prove it. The reason for it is quite simple—unit design, skid mounting, simple control with no gears to shift or brake to set, ample power and speed. You get them all in this field-engineered, performance proved engine.

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Iverson Tool Co., Texas, Artesia, New Mexico
Branchland Pipe & Supply Co., Huntington, W. Va.
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OTHER YOUNG PRODUCTS
Natural Gas Carburetors • Orifice Gas Well Testers
Under-Road Boring Machines • Electric Light Plants

Among the Drilling Contractors

McAlester Fuel Oil Co. will drill the Atlas Oil & Refining Co. et al 1 Freida Burnham, in SE NE 24-3n-5e, Rankin County, Mississippi. This is a Massive sand test.

Parker Drilling Co. has been awarded contract to drill the Mid-states Oil Co. 1 Winn et al, in NE NW 35-23n-8w, Claiborne Parish, Louisiana. Location is in the Haynesville field.

Crosby Drilling Co., Houston, has the contract on the Tegua Corp. 1 Oliver-Burdin, a 10,700-ft. wildcat test in 48-7s-6e, St. Martin Parish, Louisiana.

E. H. Christian Drilling Co., Los Angeles, has completed a contract well for Shell Oil Co., Inc. in the Antelope Hills field and is preparing to spud another in Section 6-28s-20e.

Ashby Drilling Co. has been awarded contract to drill the Gulf Refining Co. 1 Roy Badour, in SW NE NE 16-14n-6e, Bay County, Michigan.

Ajax Drilling Co. and **Pure Oil Co.** will drill the Pure Oil Co. 1 L. G. Powell, in C N½ SW NW 7-18n-4w, Clare County, Michigan.

Turner Petroleum Corp. is the drilling contractor on the Cities Service Oil Co. 2 Harold Cummings, in C N½ SE NW 33-16n-6w, Isabella County, Michigan.

Lupher Drilling Co. is the contractor on the Sohio Petroleum Co. 1 Walter Sisco, in C N½ NW NE 26-13n-6w, Isabella County, Michigan.

B & R Drilling Co. has staked location for its 1 Brack, wildcat in SE SE NW 4-17-17w, Rush County, Kansas, approximately 4 miles south of the town of Loretto.

H. C. Nelson is the drilling contractor on the Fox Hole Oil Co. 1 Emeric and Martha Roose, in N½ N½ NE 33-7n-5w, Ionia County, Michigan.

R. & S. Drilling Co. will drill the Dowell Chemical Co. 18 C. W. Deck-

New ELECTRODE HOLDER

Stubby

- LIGHTER
- EASY TO WORK
- WORKS COOLER
- LOWERS MAINTENANCE
- CUTS ROD COST 14%

Stubby weighs 14 oz. 8¼" long, 1¼" diam., 300 amp.

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UNIBOLT
(TRADE MARK REGISTERED U. S. PATENT OFFICE)
THE ONE BOLT COUPLING

UNIBOLT XMAS TREE FITTINGS

(Compared with flanged fittings!)

Weigh a great deal less . . . have a substantially higher safety factor . . . and are easier on your pocketbook.

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EXTRA SUPERIOR MANILA
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Watch for This Trademark in Post-War Days

when you must replace rope now, ask your supplier for TUBBS—always reliable!

TUBBS CORDAGE COMPANY

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Allied Supply Co., Los Angeles
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er, in NW 28-18n-8w, Osceola County, Michigan. The contractor will also drill the Dow Chemical Co. 19 Turner, Line, Halstead, Weatherby & Gruber, in SE 28-18n-8w, Osceola County.

Abbott Jenks Drilling Co. is the name of a new firm which has been organized at South Gate, Calif., to engage in contract drilling. Copartners are Paul A. Medearis and Abbott B. Jenks. The company is now drilling the first of a multiwell contract.

Howard Drilling Co., with offices in Bakersfield, Calif., is a new firm composed of J. Walter Van Atta, Chester I. Garlinger, general partners, and W. Gordon Hegarde, limited partner. Notice was filed in Kern County.

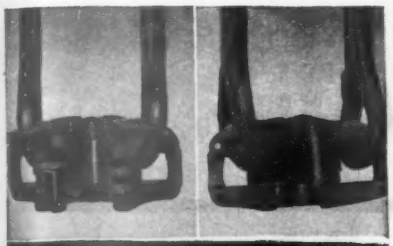
Yellowstone Drilling Co., incorporated in Wyoming, has been granted a permit to engage in contract drilling by the California State Corporation Commission. Directors of the firm are W. E. Sievers, J. D. Sievers, O. Hammer, R. M. Cook, Yountz Boles, M. H. Lockett, Oscar A. Trippett, and John U. Loomis. The company will maintain offices at 108 West Whittier Boulevard, Whittier, Calif.

Summitt Drilling Co. is the contractor on the Midstates Oil Corp. 1 Karka, in SW SW SW 20-13-5e, Lincoln County, Oklahoma. The test will be drilled to the Prue sand.

Fain-Porter Drilling Co. has been awarded drilling contract on the Continental Oil Co. 4 Caldwell, in SW SW NE 26-17-4w, in the Crescent field of Logan County, Oklahoma. Road was being built to the drill site.

Stephens Petroleum Co. is the contractor for a Charlson sand zone test at the Anderson-Prichard Oil Corp. and Tide Water Associated Oil Co. 1 Scott, in C NE NE 34-5n-8w, Grady County, Oklahoma.

Alberta Drilling & Development Co. of Calgary has two wells nearing completion in the Twin River-Del Bonita area of southern Alberta. Trans-Alberta 1, LSD 8, 21-1-20w4, is below 3,780 ft. with Madison limestone expected at 3,925 ft. McLeod-Del Bonita 1, LSD 13, 14-1-21w4, is below 4,325 ft. on a Devonian limestone test. The same company will resume work on another Devonian test, Trans-Alberta Alliance 1, LSD 18, 19-20-1w4, in the Antelope Hills area about April 1, and is near completion on Twin Province 1, LSD 6, 21-11-29w3, in western Saskatchewan, which is below 3,700 ft. with Devonian expected around 4,000 ft.



In Either Open or Closed Position

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By incorporating a newly devised roller type balancing cam in BJ "AA" Elevators the work of the derrick man is made much easier. Rated at 300 tons, with a safety factor of four to one, this elevator is made of high alloy steel—fully heat treated—flame hardened on the top bore to minimize upsetting—and is equipped with an unusually sturdy latch. Ask the BJ man or your supplier.

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"Best Bet Yet"

Now back in full production after two years' "layoff" because of war work, these oil-proof, wear-resistant, plastic rings hydraulically pressed on all sizes of tubing collars prevent the collar-to-tubing contact that causes many expensive "wet jobs" in pumping wells.

PATTERSON-BALLAGH TUBING PROTECTORS
LOS ANGELES 1 • HOUSTON 10 • NEW YORK 6

Drill fast with minimum of weight, and minimum torque.
15 degrees bottom roller action to center of hole.
Steel ball and roller bearing construction through all moving parts.
See Composite Catalog—Literature and Prices upon request.

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"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black—steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

PERSONALS

Advanced to Head Of Production Department

MAX S. APP, recently advanced to manager of General Petroleum Corp.'s production department began his service with that company in April 1912 as an engineer in the production department at Taft, Calif., in the San Joaquin Valley. He was moved to the Southern division as construction foreman in 1922 at the time of the boom days of Santa Fe Springs, Long Beach and Huntington Beach, remaining there until 1938, when he was sent back to the San Joaquin division with promotion to production superintendent.

On July 1, 1939, App was named acting general superintendent of production, with headquarters in Los Angeles, and just 9 days later he was appointed general superintendent. He was made assistant manager of the production department October 1, 1943, and he was holding that post when advanced to manager.

Dr. Martin de Simo, who joined Great Lakes Carbon Corp. of Chicago in 1941, organized its research division and directed construction of the company's central laboratories at Morton Grove, Ill., has been elected vice president in charge of research and development.

Maj. Gen. William E. R. Covell, chief of services of supply for the India-Burma theater and former assistant District of Columbia engineer commissioner, has been awarded the Distinguished Service Medal for his work in organizing the Fuels and Lubricants Division, Office of the Quartermaster General. He graduated in engineering at Massachusetts Institute of Technology.

J. L. Tatum has resigned as geologist for Plymouth Oil Co., at Sinton, Tex., to devote his time to personal business. He will continue to serve Plymouth in a consulting capacity.

C. H. ZACHRY

C. H. Zachry, formerly executive vice president and general manager of Southern Union Gas Co., Dallas, was elected president at a recent meeting of the board. He succeeds **Wofford Cain,** who will continue to serve as chairman. Zachry has been an executive of the company more than 11 years. He is a member of the managing and advisory committees of American Gas Association, Natural Gas Department, and is active in other technical organizations.

Arthur H. Petsch, formerly district geologist for The Ohio Oil Co. at San Antonio, has been transferred to Hobbs, N. M., as district geologist in the New Mexico district.

Hal C. Walker, The Ohio Oil Co., was elected president of Rocky Mountain Oil Scouts Association at its annual meeting. **Don Hulse,** The Texas Co., was chosen vice president; **Ben Hudson,** Cities Service Oil Co., secretary-treasurer; **Bert Brush,** The Carter Oil Co., editor-in-chief of the Yearbook. Membership of the association, organized in January 1944, now includes scouts from 12 major oil companies, operating in Montana, Wyoming, Colorado, western South Dakota and Nebraska and eastern Utah.

Joe C. Eason, Houston, who has been in charge of Gulf Coast producing operations under **Byron Meredith,** division superintendent, Sinclair Prairie Oil Co., has resigned to enter private business.

L. D. Romig has been made treasurer of Southern California Gas Co., succeeding **G. A. Detrick,** who retired owing to ill health. Romig will serve also as manager of the tax department.

F. G. White, formerly stationed at Luling, Tex., has been transferred to Midland, Tex., as district superintendent for Magnolia Pipe Line Co. in the North Basin district. He succeeds **F. D. Breedlove,** who is retiring after almost 20 years' service and will devote his time to ranching interests.

W. D. Davidson, for the past 11 years district clerk in East Texas and Wyoming for Sinclair Prairie Oil Co. and Sinclair Wyoming Oil Co., has joined The Sharples Corp. Petroleum Division as production foreman at Rangely, Colo. Wasatch Oil & Refining Co. and Sharples have joint holdings in the Rangely field, with Sharples as operator.

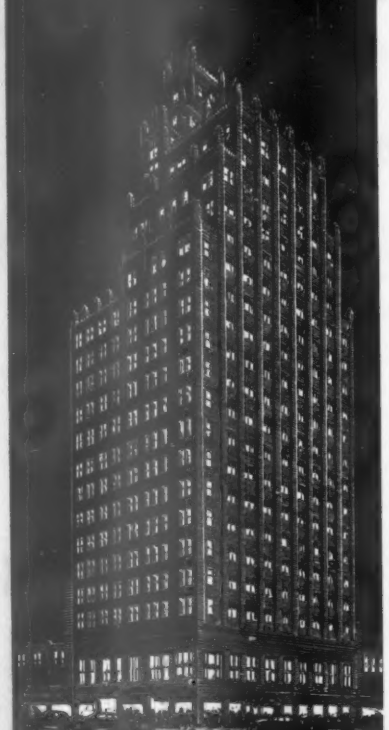
H. ZINDER

H. Zinder, for the past 7 years chief of the division of rates and research of Federal Power Commission, has joined the staff of E. Holley Poe as a senior associate. Zinder supervised FPC's activities involving gas and electric rates, also its statistical work. He graduated in engineering at Carnegie Institute of Technology and received his master's degree in business administration from Northwestern University. From 1924 to 1931 he was with Commonwealth Edison Co., Chicago, and during the next 4 years was chief rate analyst for Public Service Commission of Wisconsin.

W. Y. Pickering, geologist for The California Co., has been transferred from Ardmore, Okla., to Denver. **E. L. Rice** and **Dick Kendall** now cover the Oklahoma and North Texas district.

Dr. Charles W. Perry, formerly chief of the polymer development branch, Office of the Rubber Director, has joined the chemical products department of Phillips Petroleum Co., Bartlesville, Okla. He will be employed as a process engineer and economic analyst in connection with new chemical manufacturing developments. **J. C. Chat-**

The People you want to see will be here



Owned and managed by Texans.

The BLACKSTONE
FORT WORTH'S HOTEL OF DISTINCTION

JOE T. O'KEEFE, President
E. B. HANNA, Manager

field has been promoted from assistant manager to manager of the products supply division. **O. L. Garretson** has been named manager of the recently created engineering and equipment division of the chemical products department. **C. M. Paisley,** formerly in the U.S. Department of Agriculture's research laboratory at Peoria, Ill., has joined the chemical products department.

Alvin Summers, formerly district superintendent for Sunray Oil Co. in the Guthrie, Okla., district, now holds the same post in the northern Oklahoma district, which as the result of mergers and expansions includes the old Guthrie district. Headquarters are at Perry. **Andrew Payne,** formerly of Seminole, is field clerk.

F. H. McGuigan, Lion Oil Refining Co., was elected president of West Texas Geological Society at the annual meeting held in Midland. **Leo J. Newfarmer,** Shell Oil Co., Inc., was chosen vice president, and **Alan B. Leeper,** Honolulu Oil Corp., secretary-treasurer.

C. B. Watson, vice president of Pure Oil Co., has been named vice chairman of the petroleum industry distribution and marketing committee for District 2, Petroleum Administration for War. He succeeds **Amos Ball,** who resigned upon retiring as vice president of Standard Oil Co. of Indiana. **R. F. McConnell,** who succeeded Ball as vice president, was chosen also as a committee member to succeed Ball.

Thomas B. Romine, Sinclair Prairie Oil Co., was elected president of Fort Worth Geological Society at its annual meeting. **W. J. Nolte,** Stanolind Oil & Gas Co., was chosen vice president, and **Spencer R. Normand,** Independent Exploration Co., was reelected secretary-treasurer.

Ohio, Kentucky

(Continued from page 297)

from Clinton at 3,225-76 ft. Three additional wells are being drilled on adjoining leases.

Preston Oil Co. 1 Ray Earlywine, Section 8, Jackson Township, Knox County, flowed 130 bbl. in 24 hours. Sand was hit at 2,871 to 2,928 ft.

OHIO WILDCAT COMPLETIONS

Licking County, Harrison Township: Clyde Foraker 1 Susan Deeds, Section 3, Clinton, no sand, dry, TD 2,031 ft.

EASTERN KENTUCKY

ASHLAND.—Operations in the Eastern Kentucky field were highlighted last week by completion of two gas wells.

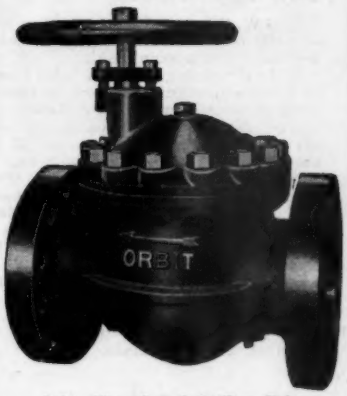
Kentucky-West Virginia Gas Co. completed 770 Robert Dameron, on Shelby Creek in Pike County, at 1,461 ft. with a daily open flow of 1,917,000 cu. ft. of gas from Maxon.

Kentucky-West Virginia 5,554 W. B. Preece, on Walnut Fork in Martin County, was completed at 1,677 ft. with a daily open flow of 725,000 cu. ft. in Maxon.

ORBIT VALVES

DRILLING VALVES ARE QUICK OPENING

ONLY 2½ to 5 TURNS ARE REQUIRED TO FULLY OPEN OR CLOSE THE ORBIT DRILLING VALVE. THE SEATS ARE PROTECTED AGAINST DAMAGE FROM DRILLING TOOLS AND WIRE LINES.



Orbit Flanged End Drilling Valve

ORBIT DRILLING VALVES ARE AVAILABLE IN BOTH FULL OPENING AND NOMINAL OPENING SIZES. WITH FLANGED OR SCREWED ENDS.

See 1944 Composite Catalog

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Earl F. Warren, Phone 919-W, Alice, Texas
Rex E. Galloup, Phone 8436, Lubbock, Texas

ORBIT VALVE COMPANY
TULSA, OKLAHOMA

Equipment Men in the News

Buxton Promoted by Cooper-Bessemer Corp.

A. M. Buxton has been promoted to assistant sales manager of The Cooper-Bessemer Corp., with headquarters at Mount Vernon, Ohio.

In addition to sharing responsibilities of the general sales manager, Buxton will direct the company's oil and gas field sales, since he has been working closely with these fields in his former position at the company's Tulsa office. Buxton has been with Cooper-Bessemer for 20 years.

Air Reduction Announces New Appointments

C. D'W. Gibson, vice president in charge of sales of Air Reduction, has announced the following appointments:

H. F. Henriques, formerly sales manager of the north central division, is appointed general sales manager. J. J. Lincoln, formerly sales manager of the south central division, is appointed director of sales services. C. M. Bloodgood, who has been serving as sales manager of the Pacific Coast division, is appointed assistant to the vice president in charge of sales.

All of the above new appointees will have offices at 60 East Forty-second Street, New York, N. Y.

H. P. Etter, heretofore manager of the Los Angeles district, is appointed sales manager of the Pacific Coast division with headquarters in the Mills Tower Building, San Francisco, Calif.

Votator Division Promotes Sales Executives

John E. Slaughter, Jr., vice president of The Girdler Corp., Louisville, Ky., in charge of the firm's Votator division, has announced two promotions in the organization. Sam N. Welch was named Votator's eastern sales manager with offices at 150 Broadway, New York, where he has been stationed since last May. Lamar Douglas Roy, Jr., was appointed midwestern sales manager and will continue to make his headquarters in Louisville.

Welch, a native of Berea, Ky., attended Berea College, Purdue and University of

S. N. WELCH

L. D. ROY, JR.

Kentucky. His territory wil include New York, New Jersey, Pennsylvania, Delaware, Maryland, and the five New England states.

Roy is a Louisvillian. He attended Columbia Military Academy. His territory includes Indiana, Ohio, Illinois, Wisconsin, Minnesota, Michigan, Iowa, Nebraska and Kansas.

Wilson Opens San Antonio Office

Wilson Supply Co., Houston, Tex., announces the opening of a branch office in San Antonio, Tex., with R. C. (Bob) Chenowith in charge. The office is located in the Alamo National Building.

McCord Makes Changes in Executive Personnel

A. C. McCord, president of McCord Corp., Detroit, Mich., announces the following changes in the executive organization:

P. L. Barter has been advanced to vice president next to the president in the operation of the business; W. G. Hancock has been elected vice president in direct charge of operations, and W. W. Harts, Jr., has been elected treasurer.

James H. Cooper as works manager is in charge of all plants.

Two Promoted by Morse Chain Co.

Morse Chain Co., division of Borg-Warner Corp., with plants at Ithaca, N. Y., and Detroit, Mich., announces the elec-

W. W. BERTRAM

R. J. HOWISON

tion of Walter W. Bertram as vice president in charge of sales, and the appointment of Robert J. Howison as sales manager. Bertram was formerly sales manager and Howison was in charge of automotive sales.

Park Rejoins Eastman

Eastman Oil Well Survey Corp. announces the return of Stafford Park to his former duties in the Long Beach, Calif., office. Having served over 2 years in the Navy, Lieutenant Park has seen considerable action in the combat areas.

M. J. Flanagan Elected President of Gaso Company

M. J. Flanagan was elected president this week of Gaso Pump & Burner Manufacturing Co., vacating the position of executive vice president and general manager.

Howard F. Stover, secretary-treasurer and sales manager, was elected executive vice president and retains his previous duties.

T. H. Flanagan, purchasing agent, becomes vice president and continues to head the company's buying organization.

Promotion of the three Gaso executives follows the recent death of T. J. Flanagan.

Worthington Pump Makes Changes in Executive Positions

The board of directors of Worthington Pump & Machinery Corp. has elected Clarence E. Searle president of the cor-

C. E. SEARLE

H. C. RAMSEY

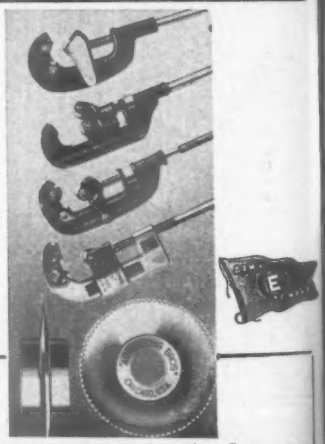
poration, to succeed Harry C. Beaver who was elected vice chairman of the board of directors, and chairman of management committee.

Beaver has been president of the corporation since 1931, and Searle has been vice president in charge of sales since joining the Worthington organization in 1932, following a long period of service in various executive capacities with Allis-Chalmers Manufacturing Co.

Hobart C. Ramsey, vice president in charge of operations, was elected executive vice president. Edwin J. Schwanhausser, vice president in charge of manufacturing and sales operations in Buffalo, was elected vice president in charge of sales. Leslie C. Ricketts, manager of the corporation's Harrison Works, was elected a vice president.

Look for the Armored Hammer

ARMSTRONG BROS.



All ARMSTRONG BROS. Pipe Cutters are made in all standard types. Each is a quality tool with hardened steel pins and rollers. "Saunder Type"—hardened end of thrust rod bears on inserted hard steel block (double life). In "Drop Forged" and "Combination" types, which take either 1 or 3 wheels, a replaceable hardened steel nut takes up thrust. In the "Barnes" type thrust rod threads through drop forged steel section.

ARMSTRONG BROS. Knife Blade Cutter Wheels (smooth or knurled) have thin penetrating edges that hold their keenness because they are machined from special vanadium tool steel, hardened and oil tempered. Fit all standard-make pipe cutters.

Write for Catalog C-39a

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